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SURGICAL METHODS IN THE TREATMENT OF PULMONARY TUBERCULOSIS.[1]

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THE subject title of this paper covers a very extensive and highly specialized field of surgery. It will be possible only to discuss broadly the various surgical measures adopted in the treatment of this disease, as each procedure in itself is a matter for separate discussion.

HISTORICAL.

Regarding the development of surgical methods in pulmonary tuberculosis one finds that surgery employed in the treatment of pulmonary tuberculosis is no new thing. In the seventeenth century attempts were made to check the fatal course of this disease. Incisions into tuberculous cavities for the purpose of drainage, applications of medicaments *et cetera*, were made with a courage that compels our admiration. The efforts were not rewarded with the success that they most certainly merited. In the year 1821 Carson, of Liverpool, uttered these prophetic words:

> It has long been my opinion that if ever this disease is to be cured, and it is an event of which I am by no means disposed to despair, it must be accomplished by mechanical means, or in other words by a surgical operation.

There can be no question that the fulfilment of that prophecy has come to pass. In 1882 Forlanini laid down the principles of artificial pneumothorax treatment, which he carried into practical effect. It was not, however, till Brauer has established it on a solid scientific basis that it became a recognized therapeutic measure.

Towards the end of last century several proposals for resection of ribs were made, and carried out with little or no success. In 1907 Friedrich, upon the request of Brauer, carried out an extensive extra-

[1] Read at a meeting of the Victorian Branch of the British Medical Association at Bendigo, on July 15, 1939.

pleural thoracoplasty, producing complete immobilization of the entire lung. From this time onwards various modifications by Wilms, Estlander *et cetera* finally led to Sauerbruch's "paravertebral resection". Nearly all present-day thoracoplasty operations are adaptations or elaborations of Sauerbruch's procedure.

Principles of Surgical Treatment.

The basic principle underlying all surgical treatment of pulmonary tuberculosis is identical with that applied to tuberculosis elsewhere, and in fact inflammation generally; it is rest.

Consider the patient with a tuberculous hip, and imagine the prospects of alleviation, much less cure of the disease, if active function and movements are allowed to continue. How, then, can the lung, the seat of tuberculous infection gross in character, be expected to recover, when it is subjected to 20,000 piston tugs by the diaphragm every twenty-four hours, in addition to the traction exerted by the respiratory excursions of the thorax? Rest is the chief aim of medical treatment, with which we are not at the moment concerned. Surgical rest is obtained by methods which produce relaxation, collapse or compression of the affected lung, allowing healing by the natural processes of retraction and fibrosis.

Pathology of Pulmonary Tuberculosis.

As a full understanding of the pathological processes in pulmonary tuberculosis is essential to rational treatment, it may be advisable briefly to consider the main two types. These two types, of such importance to the operating surgeon, are the "productive" and the "exudative".

Productive phthisis represents a strong and effective reaction against the infection and is characterized by fibrosis.

In exudative phthisis tissue reaction is poor, tuberculous infiltration and caseation are active, whilst local cellular immunity has not been achieved.

Fibrocavernous phthisis is an example of the productive type, whilst pneumonic phthisis of caseous type represents the other extreme, the exudative type. Experience has taught us the danger of performing major surgical procedures in the exudative type of case. Here the general and local immunity is poorly developed, if at all; constitutional symptoms are present, and any surgical measures adopted must be most judiciously chosen and performed, if a fatal outcome due to rapid spread of the disease is to be avoided.

On the other hand, the productive type has arrived at a stage where local and general immunological reactions have developed, where the constitutional symptoms are not at their height, and where surgical measures are tolerably well borne.

It is essential that the handling of these patients from the surgical aspect should be carried out by a "physician doomed to practise surgery", to borrow a phrase from the late Lord Moynihan, and in collaboration with a physician experienced and skilled in the management of this disease.

Collapse Therapy.

It has been mentioned that surgical methods all aim at producing relaxation or collapse of the lung, and in some cases, mainly in the thoracoplastic types of operation, actual compression of the lung.

The changes occurring in a lung which has been caused to collapse are best exemplified in the "pneumothorax" lung. Once separation of the lung from the chest wall has been effected, the natural contractibility of the organ causes a diminution in size and a considerably diminished respiratory movement. General vascular congestion and lymph stasis occur, with an increased deposit of carbon particles. These vascular and lymphatic changes lead to fibrous tissue formation in the diseased areas, encapsulation and natural cure of the disease. The normal lung tissue shares only to a small extent in this process, and so is restored to function at the conclusion of the collapse therapy. The changes occurring in the "thoracoplasty" lung are similar, but of more pronounced degree, and of course, since thoracoplasty is an irrevocable proceeding, the changes are permanent in nature.

Indications for Collapse Therapy.

If we consider the induction of artificial pneumothorax a surgical procedure, which of course technically it is, then we must regard pulmonary tuberculosis as a surgical disease, and one which on only rare occasions can be satisfactorily managed by masterly inactivity alone.

It is beyond the scope of this paper to deal in detail with all the indications and contraindications for active or surgical treatment. It is well recognized that the isolated and local apical lesion usually looks after and manages itself very satisfactorily. We also recognize that dangerous subclavicular lesion, which, if uncontrolled by active measures, rapidly spreads, caseates and cavitates—the "*zone d'alarme*" of the French, first described by Assman and Redeker. Briefly, one must consider every patient with pulmonary tuberculosis as a possible candidate for surgical measures. Every patient who is not improving or is not likely to improve or be cured by conservative measures, presents a surgical problem. True it is that some will be beyond and some will be refused surgical aid on account of various unfavourable factors; but for a large percentage surgery alone holds out the prospect of cure, arrest or alleviation of the disease.

Artificial Pneumothorax.

Although, as previously suggested, artificial pneumothorax may be regarded as a surgical method of treatment, and as such is always fully described in surgical works, it belongs, and rightly so I think, to the province of the physician skilled in this work. For this reason I do not propose to discuss it in this paper, beyond stating the fact that no other method can produce the same ideal concentric collapse and relaxation of the lung as occurs with a satisfactory pneumothorax. Unfortunately it only too frequently happens that pneumothorax may not be possible, or may be unsatisfactory, or may have to be abandoned when established.

It is in these cases that we must look for auxiliary or different methods of treatment.

Hemidiaphragmatic Paralysis.

Probably the most frequently adopted surgical measure supplementary to artificial pneumothorax is phrenic interruption or hemidiaphragmatic paralysis.

Methods.

Various methods have been adopted to bring about paralysis of the corresponding diaphragmatic leaf. Phrenic exeresis in which at least ten centimetres of the nerve are avulsed produces permanent paralysis. Phrenic crush and division of any accessory branches will usually succeed in temporarily paralysing the diaphragm for periods varying from a few weeks to six or more months.

Division of the nerve and immediate suture with division of accessory branches is a surer method of accomplishing temporary paralysis.

The trend of opinion, especially among American authorities, is in favour of temporary paralysis, repeated as required, in preference to permanent paralysis.

Indications.

There are no arbitrary indications for hemidiaphragmatic paralysis; rather it is to be employed as a supplementary aid to other methods of collapse therapy. Rarely it may be employed as an independent procedure, in cases of minimal and unilateral lesions limited to the lower lobe or lower part of the upper lobe. Usually these patients are more safely treated by artificial pneumothorax. More frequently phrenic interruption is employed to increase the effectiveness of a pneumothorax, which is rendered unsatisfactory by adhesions or a partial obliteration of the pleural space. In bilateral pulmonary tuberculosis this procedure may be adopted on the contralateral side, whilst pneumothorax is employed on the more actively diseased lung.

It is advantageous to perform hemidiaphragmatic paralysis in all pneumothoraces at the termination of treatment, as the size of the hemithorax is diminished and the degree of expansion of the compressed lung decreased. In basal and hilar cavities it is an adjunct to pneumothorax; closure of these cavities is facilitated by a still and elevated diaphragm. Complications of pneumothorax, especially the incidence of effusion, are lessened when phrenic interruption is employed in association with it. It will be seen that this surgical method is to be regarded rather as an adjunct than as an independent form of collapse therapy, and only on well-defined and rare occasions is it to be employed as the sole means of collapse. On thick-walled cavities, surrounded by infiltrated lung tissue, especially if such cavities are situated peripherally and are adherent, phrenic interruption can have no effect.

If the limitations of this operation are realized, its employment in the properly selected and suitable case is a most useful and satisfactory proceeding.

Intrapleural Pneumolysis.

As I have mentioned, the full efficiency of a pneumothorax is frequently interfered with by pleural adhesions, which prevent the satisfactory collapse of lung. Most frequently these pleural adhesions are situated over the area where collapse and relaxation are most desired. In these cases it is often possible to obtain the desired collapse by dividing these adhesions intrapleurally.

Intrapleural pneumolysis as carried out was introduced by Jacobeus, who devised the thoracoscope and elaborated the technique of cautery division of the adhesions.

The thoracoscope, which is a telescopic device after the principle of the cystoscope, is introduced through an intercostal space through a cannula. Through a second cannula the cautery (either a galvano-electrode or a diathermic electrode) is introduced, and the adhesions are divided.

Intrapleural pneumolysis is an operation requiring great dexterity in the use of these instruments, but in suitable cases, one giving the most gratifying results.

Types of Adhesions.

As described by Matson, pleuritic adhesions may occur in the following forms: (i) arachnoid, (ii) string, (iii) cord, (iv) band, (v) fan-shape, (vi) cone-shaped or funnel, (vii) spool or capstan, (viii) fold or curtain, (ix) diffuse.

Arachnoid adhesions are filmy adhesions, not containing lung tissue or blood vessels, and seldom present any great technical difficulties.

String adhesions, as their name implies, are narrow, usually rounded, not containing lung, and usually devoid of vessels of any size. They are suitable for division, which is generally accomplished without great difficulty.

Cord adhesions are similar to the last-named group, but are larger and more prone to prevent effective collapse. They do not contain lung tissue or blood vessels.

Band adhesions vary in length and thickness, and may contain blood vessels, but not lung tissue.

Fan-shaped adhesions have a broad attachment to the chest wall and frequently contain large-sized vessels in the free margin. They do not contain lung tissue and are successfully divided close to the lung attachment.

Funnel or cone-shaped adhesions usually contain lung tissue, and often the cavity is prolonged into the base of the adhesion, so that cutting is dangerous and must be done at the attachment to the chest wall.

Spool or capstan adhesions contain lung tissue and often the prolongation of the cavity, and are highly vascular. These also must be severed at the chest wall, or in many cases it is preferable to electrocoagulate the attachment at the chest wall.

Curtain and diffuse adhesions are seldom operable, and these patients will usually require other methods of treatment.

Intrapleural pneumolysis is carried out under local anæsthesia and is well tolerated by the patient. It may be necessary to carry out the procedure in

several sessions to effect division of all the adhesions which are preventing an effective pneumothorax. It may even be advisable to carry out the division of broad adhesions, such as the capstan type, in stages.

Extrapleural Pneumothorax.

Extrapleural pneumothorax is a procedure of comparatively recent development, applied to patients requiring collapse therapy when pneumothorax is inapplicable and thoracoplasty inadvisable. It is selective in type, may be adopted as a bilateral measure in suitable cases, and when practicable produces a minimum of shock and trauma to the patient.

This operation is a form of apicolysis, which has for its object the collapse of the apex of the lung and the closure of cavities therein. It is performed through an incision situated posteriorly, and by means of subperiosteal resection of portion of a rib, usually the fourth rib in the region of its angle. The pleura is then stripped from the endothoracic fascia till the entire apex is liberated and the mediastinal pleura separated as far as the hilum. The anterior, lateral and posterior surfaces are freed to a degree commensurate with the requirements of the case. Subsequent to the operation the extrapleural space is refilled with air as in intrapleural pneumothorax.

The results of this procedure have been most encouraging in suitable cases, and it has furthermore placed another valuable weapon in our hands in dealing with patients unsuitable for other methods of collapse therapy.

Multiple Intercostal Neurectomy.

For certain patients unsuitable for the methods previously described, and unfitted for or too ill to withstand more drastic measures such as thoracoplasty, Alexander has practised multiple intercostal neurectomy. By division of the first six intercostal nerves and temporary paralysis of the seventh to the ninth by crushing, the hemithorax is rendered immobile in the cadaveric position. Considering the desperate condition of the patients requiring this procedure, the results are satisfactory, as a reasonable percentage will improve sufficiently to allow more drastic collapsing measures to be adopted.

So far the methods described have all aimed at collapse and relaxation of the lung without interference to the bony structures of the thorax. Moreover, none of them are irrevocable, and at any desired moment the lung may be permitted to reexpand and resume its normal function.

There are unfortunately those cases in which it is obvious that permanent collapse is inevitable, either through the nature of the diseased lung, or through the inability to control the disease by the methods already described, and in these some type of thoracoplasty is indicated.

Various modifications of Sauerbruch's paravertebral resection have been adopted; such workers as Brauer, Maurer, Semb, Graf, Overholt and Alexander, to mention but a few of many, have contributed largely to this subject. This procedure will be dealt with in a separate paper by Dr. Hutson, and I do not intend to discuss these usual types of thoracoplasty.

As distinct from these collapsing and compressive types of procedures, mention may here be made of the Monaldi thoracoplasty.

As this operation differs entirely in its conception from the paravertebral type, a brief description of the underlying physiological principles will be given. As Monaldi points out, the lung is subjected to various stresses or tractions, which he has regarded as being dynamic and static in nature.

The diaphragm exercises dynamic traction with its maximum intensity on the medial half of the lung. The lateral part of the lung is barely influenced by diaphragmatic traction with the exception of the lower lobe to a small degree. Dynamic traction in an antero-lateral direction is exerted by the second to the seventh ribs inclusive. Static traction is exerted by the first rib and its fascial connexion upon the apex of the lung.

If, then, these various stresses and tractions be removed, relaxation of the lung occurs, allowing fibrosis and the collapse and healing of cavities not surrounded by thick fibrous walls and infiltrated lung. The advantages of such an operation are very great and numerous. Being performed mainly under local anæsthesia in two stages, it is non-traumatic, and produces in the patient a minimum of local and constitutional disturbance. For this reason it can be performed even in the presence of acute caseous pneumonia associated with severe constitutional symptoms, in the event of pneumothorax being unattainable.

It does not result in the complete elimination of large areas of healthy lung from respiration, being, as its sponsor states, an elastic thoracoplasty. It is not an irrevocable procedure, and with regeneration of the ribs, respiration is again normally resumed by the affected lung.

In suitable cases it is an ideal method of treatment, producing most satisfactory results, as the sound physiological basis of its conception would lead one to expect. For the inelastic thick-walled cavity it is not to be expected that this type of relaxation would be sufficient to obtain closure.

Finally, there remain to be considered those very difficult problems, the giant cavities and the so-called blocked cavities.

These are amongst the greatest bugbears of the surgeon treating pulmonary tuberculosis, resisting all methods of collapse and compression. The most extensive and drastic thoracoplasty, apicolysis and even plombage may succeed in shifting their position within the thorax, but all fail to effect closure. Heroic measures have been tried to close these cavities (such as incision and packing of the cavity, aspiration *et cetera*) with problematical success.

Within the past year several thoracic surgeons, both Continental and American, have performed lobectomy with a reasonable percentage of success. Whether this will finally be justified and establish itself as a legitimate method of treatment in certain selected cases, the efflux of time will determine. It has been shown by the admirable and unique work of Coryllos that these cavities are not "blocked", but rather "intermittently blocked" cavities, and that closure and healing can occur only when the

draining bronchus or bronchi are obliterated. The obliteration of the draining bronchi of these cavities has been attempted by an ingenious instrument, the cavernoscope. It is possible that in the near future some technique for the closure of this type of cavity will be perfected.

These surgical procedures which have been outlined are the most generally accepted and tried methods of dealing with pulmonary tuberculosis. Many others, possibly from personal bias, and also for reasons of space, have not been discussed.

Results.

Various percentages of cavity closure are claimed at different clinics. With the original Sauerbruch thoracoplasty closure of 50% of cavities was supposedly obtained. Semb, with his selective thoracoplasty and extensive apicolysis, claimed closure in 90% of cases, and freedom from tubercle bacilli of 80% patients. In this branch of surgery, as in all others, our ideas must be flexible, as increasing knowledge and experience alter our conceptions of the factors involved, in both the production and the method of healing of these lesions.

Tomography has certainly caused a damping of extravagant claims and any undue optimism. Nevertheless the undoubted and proven successes, resulting in definite cure or in the amelioration or arrest of the disease, have firmly established surgery as an important unit in the warfare against pulmonary tuberculosis.

SURGICAL METHODS IN THE TREATMENT OF PULMONARY TUBERCULOSIS, WITH SPECIAL REFERENCE TO THORACOPLASTY.[1]

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The Evolution of Thoracoplasty.

The development of the modern operation of thoracoplasty has been a gradual process, extending over many years, and its evolution is probably not yet completed. At the present time, although the basic principles have been well defined and a satisfactory technique evolved, there is still considerable discussion and difference of opinion concerning the most suitable type of operation, and the indications for and limitations of various suggested modifications. This difference of opinion makes it necessary that the results of various types of operation should be critically reviewed and compared with those given by other methods. Only in this way will the value of surgical treatment be appreciated and its place in any scheme of treatment clearly defined.

Modern interest in this subject dates from 1885, when De Cerenville reported the results of his attempts to obliterate tuberculous cavities by the resection of short lengths of rib from the area of thoracic wall overlying the cavity. Similar localized thoracoplasties were introduced by Quincke (1888), Spengler (1890), Turban (1896) and others, and although these were not in themselves successful, they indicated the lines of future development.

In 1907 Brauer and Friedrich attempted a much more radical procedure, in which the whole of the affected side of the chest was mobilized by the resection of considerable portions of the second to ninth ribs, together with their periosteum and intercostal muscles. This operation was based on the thesis that a considerable degree of pulmonary collapse, comparable to that given by artificial pneumothorax, must be obtained to give satisfactory results. The dangers of such an extensive and sudden mobilization were soon appreciated, and the technique was modified, principally by the adoption of the subperiosteal method of resection. This was a notable advance, for it allowed the subsequent costal regeneration to restabilize the thoracic wall. It was also found that some mobilization of the first rib was essential if collapse of the apical area was desired.

From 1909 onwards both Wilms and Sauerbruch tried various operations, and from their work emerged the "paravertebral" thoracoplasty which for many years remained the standard operation. As its name implies, this operation consisted essentially in the removal of short lengths of rib close to the vertebral column, two to three inches of each being resected. It was found that this "columnar resection" produced fairly effective collapse of the lung, and was not so dangerous nor so deforming a procedure as the radical operations mentioned above. This operation was usually performed in one stage; but in the case of an operation in several stages the lower ribs were resected first, because this method was believed to prevent the development of aspiration pneumonia in the lower lobe.

Although paravertebral thoracoplasty produces a considerable reduction in the volume of the lung, the degree of collapse is often insufficient to close medium-sized or large cavities in the upper lobe. To overcome this difficulty Brauer introduced his "paravertebral subscapular" operation, in which the ribs are resected posteriorly, but greater lengths of the upper ribs in the region underlying the scapula are removed.

Sauerbruch has always insisted that the best clinical results follow rest and relaxation of the whole lung, and that these are best obtained when both lower and upper ribs are resected. In general he was opposed to partial operations, but stressed the importance of always resecting at least portion of the first rib.

After this developmental period many investigators took up the problem and gradually modified the standard procedure. Hedblom, about 1926, first stressed the greater safety of multiple stages in the operation, and with some exceptions most surgeons are agreed on this principle. In 1924 Lambert and Miller advised the removal of the upper rather than the lower ribs at the first stage of a thoracoplasty; this was a departure from the Sauerbruch model, as Sauerbruch had consistently advocated the resection of the lower ribs as the first step in practically every operation.

[1] Read at a meeting of the Victorian Branch of the British Medical Association at Bendigo, on July 15, 1939.

It was also found that after both the paravertebral and subscapular operations the remaining lateral and anterior portions of the ribs often prevented the adequate collapse of cavities in the apical zone. Since 1928 Alexander, Graf, O'Brien and others have developed the "postero-lateral" thoracoplasty, in which the resections include the lateral and part of the anterior extent of the uppermost ribs. The development of this operation followed upon the demonstration that it was possible to resect practically all of the uppermost ribs through a posterior incision. The removal of the whole of the first rib is advised, and the second and third are divided anteriorly almost at their junctions with the costal cartilages. The resections of the fourth to seventh ribs also include a considerable portion of their lateral extent, and if division of the lower ribs is required a sufficient number are divided as far forward as appears necessary according to the position of the cavity in the individual case.

Since such an extensive area of the chest wall is mobilized the operation is necessarily performed in multiple small stages, no more than three ribs being resected at each stage. In this way very effective collapse of the apical zone can be produced without the risks of paradoxical movement and mediastinal flutter attendant on a sudden and extensive mobilization of the thoracic wall in one stage.

Even with such a wide resection there may still be a considerable volume of lung remaining uncollapsed in the costo-vertebral sulcus, protected by the vertebral transverse processes. Since many lung cavities are situated in this posterior position, some further collapse is desirable, and may be produced by the resection of the transverse processes, in whole or in part, together with the underlying sections of the costal necks. Alexander emphasizes the fact that these processes should be removed as a routine measure, particularly in the region of the cavity, and has demonstrated that their removal does not necessarily lead to scoliosis.

The operation is begun with the resection of the upper ribs, and as a rule a limited or partial thoracoplasty involving perhaps six or seven ribs is sufficient for lesions which are restricted to the upper lobes. The exact extent of the procedure necessary will of course vary with the exact position of the cavity, and since most cavities are apical in position, a complete thoracoplasty is rarely called for.

The "modern" operation, therefore, produces an extreme degree of collapse in the apical region; in the words of Alexander, it

> . . . is usually a partial thoracoplasty involving only as many ribs as are required to collapse the lesions, and not involving the ribs over the usually undiseased lower lung; great lengths of the ribs, as well as the transverse processes of the vertebræ, are removed in the region of the pulmonary cavity, the upper ribs being removed first. This operation produces even greater pulmonary collapse than did the Brauer Friedrich operation and with far less risk. The wisdom of Brauer's consistent opinion that the most effective procedure is the one that produces the greatest collapse of the lesions has been demonstrated by the modern operation.

Anterior Operations.

In some cases, particularly if technical difficulties have prevented the resection of the anterior portions of the upper ribs, subsidiary axillary or anterior operations may be needed to complete the collapse of the involved area. Again, numerous methods have been suggested; but since they all in principle recommend the resection of the anterior costal stumps, with perhaps division or removal of part of the costal cartilages, they will not be considered in detail. By means of this technique it is stated that it is possible to achieve collapse in the majority of even very large cavities in the upper lobe, and that over 80% of the patients are rendered free from infected sputum and constitutional symptoms.

The postero-lateral extrapleural thoracoplasty, with its emphasis on the necessity to secure closure of cavities, represents therefore a considerable advance in the surgical approach to the treatment of pulmonary tuberculosis, and this operation has been adopted by many thoracic surgeons.

More recently Semb has advocated the addition of extrafascial apicolysis to an extensive apical thoracoplasty, and states that by this method he is able to close over 90% of apical cavities.

A small series of approximately fifty patients has now been subjected to thoracoplasty at the Austin Hospital during the past few years. In the earliest cases operations of the Sauerbruch type were performed; but experience has shown the value of the more recent modifications, and although the change has been gradual, the operation is now planned to conform with the principles as described above, except that the procedure of extrafascial apicolysis has not yet been adopted as a routine measure.

The Aim of Collapse Therapy.

The healing of any tuberculous lesion is usually accomplished by the gradual and concentric contraction of fibrous tissue, with the eventual production of a scar. Although it is clear that collapse undoubtedly accelerates the healing of pulmonary tuberculosis, the essential factors contributing to this result are still disputed. The immediate result of any collapse procedure is the reduction of pulmonary volume. In this way tension in the lung tissue is reduced, the lung is to some extent rested and there are certain changes in its blood and lymph circulation. It is probable that the most important factor is the relaxation or reduction of tension in the lung, so that the contraction of fibrous tissue and the obliteration of cavities may proceed more readily. As a matter of experience it is found that collapse is most effective and least dangerous if the lesions have already reached a stage at which attempts at natural healing have occurred, but mechanical factors (such as tension in the lung, size of original cavity) have prevented the completion of this process.

The aim of all methods of collapse therapy is to reduce the volume of the lung or of part of the lung sufficiently to allow the closure of pulmonary cavities and the healing of tuberculous lesions.

The Necessity for Collapse Therapy.

In recent years it has been clearly recognized that the prognosis in pulmonary tuberculosis is necessarily grave if the disease has progressed to the stage of

excavation. Although it is true that some small cavities may heal under a satisfactory sanatorium regimen (and this must always remain the mainstay of treatment), in many cases the presence of a cavity is the most important factor leading to early death. The serious significance of pulmonary cavitation has been demonstrated statistically by many workers; for example, Barnes and Barnes found that 85% of 1,454 patients with cavities died within three years of admission to sanatoria, the average duration of life being a little more than a year. As a general rule it may be stated that a cavity of any size forms an urgent indication for some form of collapse therapy, and the ultimate fate of the patient depends largely upon the efficacy of that treatment.

In some measure the development of cavitation may be said to be an indication of the failure of the treatment of this disease in its early stages. This is only partially true. Even in apparently early cases the lesions may be already bilateral, or diffusely spread, so that the possibility of active treatment is immediately limited. On the other hand the evolution of the disease may be so insidious that thick-walled cavities may be present before the patient is led to suspect that he is ill. It is mainly because so many patients have far advanced and bilateral disease before the diagnosis is made that the proportion who eventually prove suitable for the various forms of collapse therapy is relatively small.

Some of the surgical methods available for the production of pulmonary collapse and their relation to each other may now be considered.

Artificial Pneumothorax.

Since artificial pneumothorax is in general the most readily available and most effective collapse procedure, its trial should almost always precede the decision to resort to other surgical measures. In those cases in which collapse is satisfactorily maintained there is rarely any indication for further interference. Unfortunately, in a large percentage of cases in which collapse therapy is required, extensive adhesions prevent adequate collapse of the lung, and in others the development of an obliterative pleuritis necessitates premature abandonment of the pneumothorax. If the adhesions are only of limited extent, or if several fine adhesions hold out the area of lung containing the cavity, the intrapleural division of these bands is the simplest and most effective way by which an unsatisfactory artificial pneumothorax can be made satisfactory. Although the number of cases in which the thoracoscope may be used is limited and the procedure is not free from risk, in successful cases the results may be dramatic. We must regret, however, that the method has been used only infrequently in Melbourne, owing to the lack of unanimity of opinion in the selection of suitable cases. From the skiagrams alone it is difficult to decide whether or not the adhesions in any particular case are suitable for thoracoplastic division. It is felt, therefore, that thoracoplastic examination in doubtful cases should be carried out more frequently.

Although the pleural cavity is completely or partially obliterated in the majority of cases in which thoracoplasty is eventually necessary, it is important to be able to demonstrate this fact. If no air can be introduced by the pneumothorax needle, it can be concluded that the pleural layers are firm, and in some cases at least that there is probably some mediastinal rigidity. These are both important factors contributing to the eventual safety of operation, because they greatly reduce the liability to extensive paradoxical respiration in the post-operative period.

The skiagrams of Figure I illustrate the importance of the preliminary trial of pneumothorax. Figure I shows the condition of the chest some months after the institution of artificial pneumothorax. It will be seen that there is a large cavity in the upper lobe of the right lung, held open by numerous firm adhesions. The mediastinum has been considerably displaced to the left and a pleural hernia with protrusion of the right lung through the anterior part of the mediastinum into the left side of the chest is evident. Under fluoroscopic examination the mediastinum was seen to be extremely mobile, apparently moving about two inches with respiration. The hernia also varied in size, becoming much more evident in expiration. At this stage the pneumothorax was abandoned and the right phrenic nerve was divided. After several months a skiagram (Figure II) showed that the air had been absorbed and that the mediastinum was now pulled considerable to the right. The diaphragm had also risen since the phrenic section and the cavity had much decreased in size. Since the obliteration of a pneumothorax is almost invariably accompanied by a firm adhesion of the pleural layers, thoracoplasty could now be performed without the risk of operation in the presence of a free pleural cavity and mobile mediastinum. Figure III shows the cavity obliterated after a postero-lateral thoracoplasty involving the upper seven ribs.

In some cases the skiagrams may show distortion of the mediastinum, "tenting" of the diaphragm and extensive fibrosis indicating the probable presence of extensive pleural adhesions. Even in these cases, however, one can not be in any way certain that a pneumothorax will not be satisfactory without demonstrating this fact by actual trial. Even if only a partial pneumothorax is obtained the adhesions may be disposed so that the pull is in a vertical direction and the addition of diaphragmatic paralysis may enable adequate collapse to be maintained.

On the other hand an unsuitable pneumothorax should not be carried on indefinitely if it is only partial and fails to secure closure of the cavities. The risks accompanying the maintenance of a pneumothorax in the presence of numerous adhesions are so great that the operative risk of thoracoplasty is often preferable. The rupture of an adhesion may easily liberate tubercle bacilli in the pleural cavity, and a disastrous pyopneumothorax may result. A partial pneumothorax is also difficult to maintain, and may easily be lost if the progress is not carefully followed by frequent radiographic examinations.

In addition the final result of an unsatisfactory partial pneumothorax is very often poor. Matson,

Matson and Bisaillon, in an analysis of 600 patients, showed that if the pneumothorax was satisfactory 48% of the patients became clinically well, but that of those with partial pneumothorax only 11% became well. For these reasons the question of further procedures should be considered as soon as it is evident that a pneumothorax is unlikely to be finally successful.

Extrapleural Pneumothorax.

The technique of extrapleural pneumothorax was introduced by Graf as a substitute for intrapleural pneumothorax in those cases in which the pleural cavity was partially or completely obliterated. Satisfactory initial results have been reported by many clinics; but since the method has not so far been adopted at the Austin Hospital, the indications for and merits of the procedure will not be discussed.

Diaphragmatic Paralysis.

The value of diaphragmatic paralysis, either as a primary procedure or as a preliminary to thoracoplasty, is still to a certain extent disputed.

Phrenic section may undoubtedly assist in the closure of small pulmonary cavities, and, used in conjunction with a full sanatorium routine, may prove sufficient to control the disease in many early cases. On the other hand, it is most useful either as a substitute for artificial pneumothorax in those cases in which the latter procedure has proved impracticable, or particularly when used in association with pneumothorax to supplement or complete the collapse. It may therefore be stated that phrenic section should be considered when collapse of the lung is desirable, (*a*) for early lesions with minimal cavitation, (*b*) as a substitute for an unsatisfactory pneumothorax if the disease is not so extensive as to make thoracoplasty desirable, (*c*) in association with pneumothorax either to increase the basal collapse or to diminish the volume of the thorax during the obliteration of the pneumothorax, (*d*) for the control of hæmorrhage, (*e*) to relieve symptoms arising from diaphragmatic adhesions.

Most difficulty arises, however, when the relation of phrenic section to thoracoplasty is being considered. In those cases in which the disease is minimal and small cavities require collapse therapy, phrenicectomy, or pneumothorax, or both, may adequately control the disease and completely close the cavity. There is then no indication for further surgery. If a pneumothorax cannot be induced in cases of more extensive cavitation, should phrenic section always be tried? If the cavities have thick walls and are more than a few centimetres in diameter, it is improbable that they will close after phrenic section alone. On the other hand, the elevation of the diaphragm may allow the upward migration of a cavity by a general retraction of the lesions, so that a less extensive thoracoplasty may then be sufficient to complete healing. In addition, the improvement of the general condition following phrenicectomy may be so great that the operative risk of later thoracoplasty is much reduced.

Sauerbruch advised that phrenic section should invariably precede thoracoplasty, mainly as a means of determining whether any suspiciously active tuberculous lesions in the other lung would be unfavourably affected by the collapse. In recent years, however, most surgeons have agreed that the testing of the lung by this means is of very little or no value. Activation occurs after phrenicectomy only if the lesions in the other lung are exudative and acute—that is, of a type which would of itself contraindicate thoracoplasty.

In addition it was suggested that phrenic section would decrease the risk of aspiration pneumonia in the lower lobe following operations on the upper lobe; but accumulated evidence indicates that there is no significant difference in the frequency of this complication in either case.

Alexander has recently emphasized the advantage of the retention of the function of the diaphragm, particularly in those cases in which a partial upper thoracoplasty is performed. In this case the function of the lower lobe will be preserved and the patient spared further reduction of his vital capacity. Alexander also stresses the value of temporary paralysis effected by crushing of the phrenic nerve. In this way the patient may derive considerable symptomatic improvement, enabling a thoracoplasty to be safely performed, and yet regain the function of the uncollapsed portions of the lower lobe several months later.

In all cases, therefore, the value of the various collapse procedures must be considered in relation to the individual patient. As a general rule the simplest procedure which offers a reasonable chance of success will be chosen, with the important provision that further measures should be undertaken as soon as it is clear that no further benefit can be obtained with the simpler operation. The methods of collapse are to a certain extent supplementary, and may be used in sequence.

In the present series, pneumothorax was first attempted as the method of choice in the majority of cases. In many no pleural space was found, and in others the collapse was unsatisfactory and could not be maintained. The development of a complicating pyopneumothorax was an eventual indication for thoracoplasty in several cases.

In many of those cases in which a partial pneumothorax was obtained, phrenicectomy was also performed in the attempt to supplement incomplete collapse before the alternative of thoracoplasty was considered. On the other hand, if it appeared clear that thoracoplasty would eventually prove necessary, this was carried out as an elective procedure without preliminary phrenicectomy. In cases in which the disease was less extensive, phrenic section was occasionally used as a trial measure until it became evident that more extensive collapse was necessary.

It is suggested, therefore, that the trial of artificial pneumothorax should always precede thoracoplasty, but I do not consider phrenicectomy to be an essential preliminary to the major operation.

The Indications for Thoracoplasty.

It is important to realize that thoracoplasty is primarily a method of treatment designed to bring about the closure of cavities which have resisted other

therapeutic measures. It must form part of a definite scheme of treatment, and not be advocated merely as a last resort in the face of rapidly advancing or apparently hopeless disease.

The question of the advisability of thoracoplasty does not usually arise until it has been demonstrated that other simpler methods are unsuitable or have failed to control the disease. This implies that the patient will already have been under observation for some considerable time, and gives an opportunity for the careful study of his progress and resistance to the disease. In some cases it may soon be evident that thoracoplasty will eventually prove necessary; but in others, owing to the variable and slow evolution of the lesions, the necessity may be apparent only after a long period of observation. Patients originally presenting themselves with acute and perhaps widespread disease may eventually reach a stage at which considerable resolution and healing have occurred; but operation may still be indicated to close a persistent residual cavity.

In suitable cases operation should not be too long delayed, and Alexander states that it should be performed as soon as the indications are clear. Morriston Davies states that every case of unilateral pulmonary tuberculosis should be regarded from the first as a potential case for thoracoplasty. If cavitation appears and collapse therapy is necessary, the procedures are tried in sequence, and thoracoplasty is advocated as soon as the failure of other methods is apparent. On the other hand, the indications for operation must be definite, and it is certain that no real advance in surgical treatment will be made if the operation is discredited by its performance in unsuitable cases.

Since thoracoplasty is of necessity a major operation, even when performed in multiple stages, it can be safely recommended only for patients in good general condition. The general appearance is of great value in assessing the probable risk of operation. A patient who looks well will stand the procedure easily, and if his cavities are closed may look forward to many years of useful life. On the other hand the immediate risk to a severely ill and cachectic individual is great, and operation may only result in further disability due to the inevitable reduction of vital capacity.

For this reason operation should not be performed on patients after middle life, nor on those who do not possess an ample cardio-respiratory reserve.

It has been repeatedly demonstrated, and most thoracic surgeons are agreed, that operation is contraindicated in the presence of active exudative lesions, particularly if these have already increased in size or new lesions have appeared. Even small exudative foci are a source of danger because of their liability to rapid progression after the stress of operation. In determining the type of lesion present, although due consideration must be given to the clinical and laboratory findings, one must usually depend upon the accurate interpretation of the radiological appearances. In the event of doubt concerning the exact significance of a particular shadow, decision should be delayed until it can be seen whether the lesion is progressive or becoming harder and more fibrotic.

Operation, then, will rarely be indicated unless there is a cavity which has persisted despite other methods of treatment, and will be a safe procedure only in those cases in which the pulmonary lesions are predominantly productive or have become fibrotic in type. In other words, operation should be undertaken only to remove the mechanical barrier to healing in those patients who possess a favourable natural resistance to the disease.

Although in recent years increasing use has been made of bilateral artificial pneumothorax, it is only in rare instances that the possibility of bilateral partial thoracoplasty can be considered. As a general rule operation must be restricted to unilateral cases, and in the ideal case the opposite lung should be, at least for practical purposes, normal. In most cases, however, this lung shows some evidence of past infection, usually in the form of slight fibrous scarring or a few encapsulated and fibrotic nodules. These do not necessarily contraindicate operation, but make it imperative that their course and evolution should be closely followed in serial skiagrams before a decision is made.

The presence of cavitation in the opposite lung is usually a definite contraindication to operation, unless the cavity is very small, stationary in size, and situated at the extreme apex. In this case, however, caution is necessary, and operation should be recommended only if all other circumstances are favourable.

Preoperative Period.

The decision to recommend thoracoplasty can be made only after careful consideration has been given to every aspect of the individual case. Even if the physical indications are clear the final decision may be influenced by many other social and environmental factors. After the patient has agreed to the consideration of operation a period of observation in hospital is vitally necessary, during which time the cooperation of the patient must be gained.

The surgeon must be reasonably certain that the operation is not performed during a phase of evolution or activity of the disease. The accurate recording of the temperature, the pulse rate and the blood sedimentation rate, and a comparison of these with the previous records, will be a guide here. An X ray examination should be made a few days before operation in order to be sure that no new exudative lesions have appeared, particularly in the less extensively diseased lung. The amount of sputum is recorded daily for comparison with the post-operative amounts. Although the aim of treatment is to free the patient of infected sputum, the amount of sputum is not in itself an indication for or against operation.

A general survey of the patient's physical condition should be undertaken, special attention being paid to the cardio-respiratory system. The sound lung should be free of any other respiratory disease which may reduce its function. The estimation of the hæmoglobin value and of the erythrocyte count is important, for minor grades of anæmia are frequent and respond well to medicinal and dietetic treatment.

It is important to exclude the possibility of latent renal infection, and since renal tuberculosis is

occasionally present without any significant symptoms, several twenty-four-hour specimens of urine should be examined for the tubercle bacilli microscopically and preferably also by the newer cultural methods. The larynx should also be examined for tuberculous infiltration, and although operation may be indicated in the attempt to arrest early disease it is contraindicated if the laryngeal involvement is severe and dominates the clinical picture.

In our recent cases the sensitivity to tuberculin has been estimated before operation. It is believed that if the patient is sensitive to high dilutions of tuberculin the risks of a hyperallergic reaction and rapid spread of the disease are much increased. In these cases it would appear wise to postpone operation till the sensitivity is reduced by a short course of tuberculin injections.

Tuberculous Empyema.

In occasional cases both of tuberculous and of mixed tuberculous and pyogenic empyema, thoracoplasty may be indicated to close the residual cavity after the effusion has been controlled by repeated aspiration and replacement or by continuous suction drainage.

Summary of Indications for Thoracoplasty.

The aim of surgical methods in the treatment of pulmonary tuberculosis is the promotion of healing by permitting the closure of pulmonary cavities. Collapse therapy does not replace medical treatment and should always be used in association with efficient sanatorium management.

Thoracoplasty is indicated for patients with unilateral, chronic fibrocavernous disease when other simpler methods have failed. The patient must be in good general condition, and possess an adequate cardio-respiratory reserve. Operation should not be performed during a phase of activity or progression of the disease, or in the presence of active tuberculous lesions in other regions.

Results of Thoracoplasty.

The immediate results of thoracoplasty can be estimated by a consideration of the following criteria: (*a*) freedom from constitutional symptoms and ability to work; (*b*) presence or absence of sputum and its content of tubercle bacilli; (*c*) the radiological findings, especially with regard to the obliteration or persistence of cavities; (*d*) the duration of the period of good health as compared with the results of treatment by other methods. On this basis many of the recently published statistics record excellent results and show that in suitable cases probably 70% to 80% of patients can be restored to health.

When the results of thoracoplasty are being considered, particular consideration must be given to the progressive nature of well-established disease, and also to the fact that the patients who are eventually submitted to operation have usually had other available methods of treatment tried without success.

Although thoracoplasty is undertaken in the attempt to arrest the progress of a potentially dangerous lesion, in most cases the threat to the patient's life is not immediate. Therefore, since the natural progression of the disease may be slow, the results of treatment can be finally assessed only after the patient's progress has been followed for some years. It is probably unjustifiable ever to claim cure of the disease, although if the patient remains in good health for two to three years clinical cure can be assumed.

After thoracoplasty there may be a very rapid symptomatic improvement and all constitutional phenomena disappear within a few weeks. These are usually favourable cases in which early closure of cavities has been obtained. In others in which the cavities, while reduced in size, have not been obliterated, as seen in early post-operative skiagrams, improvement may be much slower and yet may gradually continue during many months. One cannot expect that even the apposition of the walls of chronic tuberculous cavities will immediately lead to healing.

Experience in dealing with open tuberculous wounds shows that even when complete relaxation and immobilization of tissues have been achieved and no mechanical bar to healing exists, the initiation of the process may be long delayed. On the other hand, a wound that has made no progress during even twelve months may with an improvement in general resistance close rapidly and firmly.

If, therefore, the surgeon is able to remove any mechanical barrier to the contraction and fibrosis of a cavity, he has initiated a train of events which may ultimately lead to healing, even though he has been unable to secure immediate apposition of the cavity walls.

Since the physical signs in the chest following thoracoplasty are always anomalous and difficult to interpret, and because even serial Potter-Bucky skiagrams may fail to reveal a small residual cavity, the amount and nature of the sputum remain the most reliable guide to the state of the lesion. The tomograph would be of great value here, but is not yet generally available.

If prompt closure of the cavity is attained, the sputum may rapidly diminish in amount and be absent within several weeks; on the other hand, the gradual shrinking of a large cavity may temporarily extrude a large quantity of muco-purulent débris. In general the amount of sputum slowly decreases during a few months, and in many favourable cases entirely disappears within this time.

The sputum should be examined for tubercle bacilli soon after the completion of operation. If bacilli are not found on a routine smear stained by the Ziehl-Neelsen method, similar smears should be examined each day for a week and the examination should be repeated later before the sputum is reported as "negative". In the light of modern views, the sputum should also be subjected to cultural methods before freedom from tubercle bacilli can be confidently assumed.

If the sputum continues to contain tubercle bacilli in the absence of any radiologically demonstrable lesion in previously uninvolved areas, the cavity almost certainly remains open. The question of the necessity of further operative procedures must then be considered. If skiagrams reveal an apparently

satisfactory collapse, apart from complete apposition of cavity walls, decision is difficult. Further slow retraction and fibrosis may eventually produce satisfactory closure and healing, and on the other hand if a necessary subsidiary procedure is too long delayed, regeneration of the originally resected ribs may prevent further relaxation of the affected area. The skiagrams must be reviewed in an attempt to assess the probability of further spontaneous retraction from the anatomical viewpoint, and this forms the basis for the final decision.

In those cases in which further operation is for some reason undesirable, the persistence of tubercle bacilli in the sputum usually means that there is some degree of toxæmia, though it may be only slight. Although the patient is often considerably improved in general health, the menace of possible further spread of the disease still remains. Despite apparently "good chronic" health, the aim of modern collapse therapy has not been attained; and to this extent these cases must be classed as surgical failures.

In some cases a variable amount of non-tuberculous sputum persists indefinitely. This may arise from a preexisting nasal sinusitis or may originate in a non-specific chronic bronchitis.

After-care and Rehabilitation.

The successful issue of thoracoplasty largely depends on the care which is devoted to the management in the post-operative period and particularly on the adequate supervision of the long period of convalescence.

The decision to allow the patient out of bed is made only after a careful consideration of the temperature and pulse rate, the serial estimations of the blood sedimentation rate, the skiagrams and the patient's general appearance and feeling of well-being.

The patient should feel and look well and have very little cough, and in the majority of cases the sputum should not contain tubercle bacilli. The tolerance to activity is carefully watched, so that reaction may be avoided. In general a rigid sanatorium regimen is observed for several months, so that few patients return to their homes within nine months of the commencement of operation.

The usual total period of supervision thus extends over twelve months; and work is not usually begun within eighteen months. As in all cases of tuberculosis, this period of return to ordinary life is the most critical the patient has to face. It is here that the influence of unfavourable social, environmental and economic factors may so easily lead to a recurrence of such an inexorable disease.

Results in a Series of Forty-seven Cases.

Since 1931, 47 patients have been subjected to thoracoplasty at the Austin Hospital; of these, 40 were suffering from fibrocavernous pulmonary tuberculosis, and the lesions of the remaining seven were complicated by the presence of an empyema.

In many, particularly of the early cases, the disease was extensive, and judged by present standards the lesions were of a type definitely unfavourable to operation. A total of 115 operations have been performed, and including all cases the mortality rate of operation was 15%. During the eight-year period several other patients have died from a progression or recurrence of the disease, and the total mortality rate from all causes is now 27·6%.

Thirty-four of the patients are still living, and of this number 70% have either no sputum, or sputum which microscopically does not contain tubercle bacilli. In 30% residual or slit cavities are still visible and the sputum contains tubercle bacilli. The majority of these patients with residual cavities can be classified as improved in health, although the aim of modern methods of treatment has not been achieved.

Eighteen patients (53%) have remained well and have returned to their normal or some suitable occupation; in addition a number of the more recent patients are also in good health, but have not yet completed their full period of after-care. Since several of the earlier patients have now remained in good health for over five years, and only one patient has relapsed, these results may be considered encouraging and compare favourably with those obtained by other methods of treatment.

Acknowledgement.

I wish to express my sincere thanks to Dr. Hugh C. Trumble and Dr. J. Bell Ferguson for their kindness in allowing me to present this survey, which is based on the treatment of their patients as carried out at the Austin Hospital. The medical management has been under the careful direction of Dr. Bell Ferguson, and the surgical treatment has been mainly in the hands of Dr. Hugh C. Trumble, whose skill and enthusiasm are responsible for the successful results obtained in so many cases.

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LYMPHOPATHIA VENEREUM OR ESTHIOMENE, WITH REPORT OF A CASE.

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A comprehensive review of venereal lymphogranuloma, or *lymphopathia venereum*, has not appeared in Australian medical literature. Hugh Stannus's excellent monograph is one of the few exhaustive treatises on the disease in the English language. Rigney D'Auroy and Emmerich von Haam, of New Orleans, have just published the

results of their intensive study of the disease, which is extending now into its sixth year. Our article is a short survey of the subject, touching briefly on the history, clinical manifestations, pathological lesion, biological characteristics of the causal agent and the various methods of diagnosis and therapy, together with the report of a most typical case in a female presenting all the most prominent features of the disease.

Hugier is credited with the first description of the disease in 1848. He gave the following account of it:

> This chronic malady, which lies in some intermediate position between elephantiasis of the Arabs, syphilis, cancer and scrofula, and to be distinguished from the latter, is characterized by the leaden or violaceous colour of the affected parts; their deformation, thickening and induration, the ulceration and destruction, at the same time infiltration and hypertrophy, so that the orifices and passages of the vulva and anus may be at the same time the seat of ulceration and enlargement as well as stricture, while the folds of the skin and mucous membrane manifest thickening, fibrosis and ulceration of variable degree and destruction, without pain or tenderness, without menacing life and without even injuring the general health, at all events for a very long time.

Hugier invented the word "esthiomene" to describe this lesion. He believed—and he has been proved right only after the lapse of eighty years—that the disease was neither syphilitic, tuberculous nor cancerous. Then, in 1913, Nicholas and Favre published the reports of their exhaustive studies; and in 1925 a further important development was the discovery by Frei of a specific cutaneous reaction resulting from the infection. He showed that an intracutaneous injection of 0·1 cubic centimetre of diluted pus taken from the buboes of human venereal lymphogranuloma and sterilized by fractional heating, produced in all those affected or who had been affected with the disease, pronounced induration with erythema at the site of injection, reaching its maximum in forty-eight hours.

The disease in its various manifestations is found in all parts of the world, but it is more prevalent in temperate, tropical and subtropical climates. It is endemic in North and South America, Asia and Australia, and along the coasts of Africa. There is a preponderance of the disease among males; and the older literature, with its very small incidence in the female, has been shown to be at fault. Those authors who have dealt with a large number of patients all stress the fact that the negro race is more prone to contract the disease than the white race. Most of their series show the negro to be affected in the ratio of two to one.

As with other venereal diseases, the period of sexual activity (twenty to forty years) is that in which the greatest incidence of *lymphopathia venereum* is seen. The affected patients belong to low social classes. Female patients are very often prostitutes, and the largest group of white male patients is made up of sailors. Two years after recognition of *lymphopathia venereum* in New Orleans it became necessary to open a special clinic to deal with the patients. There, from ten to twelve new patients are seen each day. In addition, the wards of the public hospitals are filled with patients suffering hopelessly from inflammatory stricture of the rectum.

Lymphopathia venereum and esthiomene are the terms used to denote a venereal disease due to an infection with an ultra-microscopic filtrable virus. They cover lesions which have in the past been described as climatic bubo, *lymphogranuloma inguinale*, esthiomene, chronic elephantiasis and ulceration of the vulva, the genito-ano-rectal syndrome, inflammatory stricture of the rectum. The virus has been recovered from the tissues and exudates of the primary lesion, from the pus and tissues of inguinal buboes, from the tissues of the chronic lesions—esthiomene and inflammatory stricture of the rectum—and from the spinal fluid of patients suffering from the disease in the acute form. In most cases the genital tract is the portal of entry for the virus in man. The virus is probably transmitted through direct contact with the diseased mucosa during coitus.

The period of incubation varies between three days and three weeks. It is unknown whether natural immunity to the disease occurs in man. Without doubt the appearance of specific sensitivity to Frei's antigen indicates the production of specific antibodies in human and animal hosts. The most common primary lesion is a small herpes-like eruption, usually located on the inner aspect of the labia, which is neither tender nor suppurating and shows a tendency to spontaneous healing. These lesions are often completely overlooked by the patient and have often disappeared by the time a medical man is consulted.

The disease manifests itself in two main directions. The first is that in which the lymphatic drainage to the groins is affected and inguinal lymphogranuloma becomes the main feature of the disease. This has been called *lymphopathia venereum*. The second is that in which the lymphatic drainage of the glands around the lower segment of the rectum (the glands of Gerota) is affected and the outstanding feature is the genito-ano-rectal syndrome. Inflammatory stricture of the rectum may occur in association with the other elements of the syndrome. The genito-ano-rectal syndrome is more common in the female and chronic adenitis more frequent in the male.

The Frei reaction is generally accepted as the definite criterion of existing or past infection with the filtrable virus of *lymphopathia venereum*. A positive reaction depends on sensitization of tissues to the virus or its by-products. While it is generally regarded as a localized disease, there are investigators who on the basis of experimental and clinical findings view this entity as a generalized infection with local manifestations at the portal of entry. The results of numerous Frei tests show that in the female stricture of the rectum and esthiomene of the vulva usually result from invasion by the virus, and stricture of the rectum is the common mani-

festation of the disease. The complaints are those of low-grade obstruction with infection of the rectum and associated lesions of the anus and perirectal tissues. The most dreaded complication is the recto-vaginal fistula which is present in a large number of cases.

The generally accepted explanation of the pathological basis of esthiomene is lymph stasis following lymphatic obstruction. Two constant laboratory findings, which may have a differential value, are a rapid sedimentation time of the erythrocytes and a reversal of the albumin-globulin ratio in the blood serum without the presence of œdema.

It is suggested that the predominance of rectal stricture in women is due to the fact that the lymphatics of the posterior wall of the vagina and the *fossa navicularis* drain to the subperitoneal surface of the rectum, where they join with the lymphatics coming from the rectal submucosa, where the oldest and most prominent lesion of rectal stricture is found. It is possible that this could be affected by progressive septic thrombosis of the lymphatics. The more common location of the lesion in the ampulla is attributed to the unusually rich mucosal lymphatics in the region. More or less severe constitutional symptoms are rather characteristic of the acute stage of *lymphopathia venereum*, and these must be considered as important factors in the differential diagnosis. A rise in temperature occurs in 50% of cases. Remote lesions ascribed to *lymphopathia venereum* are being observed with increasing frequency. Among these are short-lasting attacks of polyarthritis, which a number of authors have noted.

A wide variety of parenteral and local treatment has no appreciable influence on the disease. It would seem that cure probably results only when the individual becomes immune to the virus. The transfer of passive immunity by injection of serum from individuals with healed lesions seems to offer the greatest possibilities in the treatment of this disease.

The clinical signs and symptoms are the following: prevalent discharge *per vaginam*, ulceration of the vulva, stricture of the rectum or chronic inguinal adenitis or both. There may be pronounced swelling of the whole or part of the vulva, urethral and vaginal stricture and ulceration.

The differential diagnosis of *lymphopathia venereum* with esthiomene from elephantiasis of the vulva depends on the following factors: (i) a positive Frei reaction; (ii) inability to find filaria in the blood or glands; (iii) a rapid blood sedimentation rate; (iv) ulceration, which is pronounced in esthiomene, not in elephantiasis; (v) enlargement, irregular in esthiomene, but regular in elephantiasis; (vi) the age of the patient, since esthiomene generally occurs in elderly women.

The differential diagnosis from *granuloma inguinale* depends on the following factors: (i) a positive Frei reaction; (ii) a rapid blood sedimentation rate; (iii) the fact that antimony has no effect on the disease; (iv) examinations of sections and biopsy; (v) absence of Donovan's bacilli, which are rod-shaped intracellular bacilli obtained from the spreading ulcer of *granuloma inguinale* and said by some to be diagnostic.

The treatment of *lymphopathia venereum* is along the following lines. Local applications of *Lotio Nigra* are made to the vulva. The thickened tissue is excised, and if necessary vulvectomy or clitorectomy is performed. The inguinal glands are aspirated, the stricture of the rectum is dilated digitally. Sulphanilamide is administered to clear up the discharge *per vaginam* and *per rectum*, and for any superadded infection.

In addition, general treatment is given. A course of injections of Frei antigen is given and serum from a proved patient is also administered. Hydrochloric acid is administered if achlorhydria is a feature, and antisyphilitic treatment is given if syphilis is present. Blood tonics are also employed for associated anæmia.

Report of Case.

R.Z., a married woman, aged fifty-nine years, had married for the first time in 1910. She had no children or miscarriages. Her husband died of tuberculosis. In 1920 she had two courses of antispecific treatment, and Dr. Ramsay Sharp declared that her blood did not react to the Wassermann test. In 1924 she married a second time. She had no children or miscarriages by this marriage. In 1927 she was in Suva, Fiji, for nine months. In 1930 she first noticed that the skin around the vulva began to feel hard; a mild ache rather than pain was present. She also complained of frequency of micturition and that urine "ran away" from her; but there was no stress incontinence. There seems to be some doubt as to whether this was a vaginal discharge or the escape of urine. At the time she was very "run down" and complained of pain in the right leg and swelling of the ankle.

On July 10, 1931, she visited the out-patient department at Sydney Hospital for the first time. It was then noted that a yellow discharge had been present for four months. Her last menstrual period had been three years earlier, in 1928; she was then forty-eight years old. The vaginal passages were small and a free, thin, vaginal discharge was present. A provisional diagnosis of vulval and vaginal papillomata was made. On August 7, 1931, her blood did not react to the Wassermann test. She was treated with mercury biniodide lotion for several months and was given iodides by mouth. On January 5, 1932, a diagnosis of arthritis of both knees was made. At this time the vaginal discharge was less. On April 18, 1933, she was found to have a discharge *per vaginam* and a swelling on the left side of the vagina, and pain was present in the left lower quadrant of the abdomen. On examination cellulitis at the vulva and of the anterior vaginal wall was found. There was a profuse discharge *per vaginam*. On May 12, 1933, the Wassermann test still elicited no reaction; but there was a "++" reaction to the Kahn test. The vagina was again swollen and there was an indurated mass at the floor of the urethra. On September 3, 1933, the patient was admitted to hospital for a biopsy, with a provisional diagnosis of tuberculosis of the vagina. A large ulcer was present on the posterior and right lateral vaginal walls. There was a small recto-vaginal fistula. The urethra was situated much lower than normal and was surrounded by a fringe of œdematous tissue.

A pathological report by Dr. Keith Inglis was as follows:

> Appearances are in keeping with clinical diagnosis of syphilis, but not in themselves diagnostic of that condition.

The patient was discharged and it was recorded that she was suffering from esthiomene.

No further records were available until 1939, as the patient was living in Adelaide. She was admitted to hospital in July, 1939, and she now states that the swelling has generally increased in size, but more rapidly so, reaching its present proportions in the last nine weeks. She complains of pain on defæcation of four years' duration, incontinence of urine of five years' duration, worse in June, 1939, and of swelling of the vulva without pain or irritation.

Examination reveals the typical thickening and leaden colour of the skin of the whole of the vulva and gluteal region, more particularly on the left side, with isolated scarring due to healed ulcer. Elephantiasis of the clitoris and vulva (particularly the left *labium major*) is pronounced (Figure I). The urethra shows evidence of

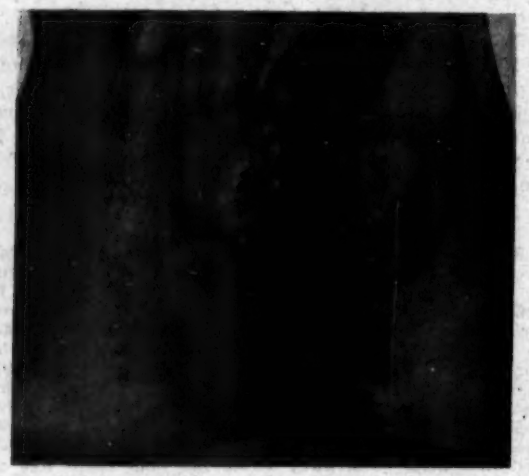

Figure I.
1: Elephantiasis of labium; 2: elephantiasis of clitoris; 3: stricture of rectum; 4: thickening of skin in left gluteal region with scarring due to healed ulcer.

extensive old ulceration, which has now completely healed, together with a large urethral caruncle. The vaginal orifice and the lower third of the vagina contain old scars with a narrowed introitus. The rectum is the site of an extensive cylindrical stricture extending for one and a half inches along the gut from half an inch inside the anus. When the patient was first seen the stricture would not admit the tip of the little finger. Regular dilatation since then has made it possible for the index finger to pass with difficulty. In this case there was no palpable enlargement of the inguinal glands.

The condition was investigated thoroughly and the following information was obtained. Examination of a catheter specimen of urine showed that a few pus cells were present; but no organisms were grown on attempted culture. A test meal showed that the patient suffered from complete achlorhydria. The Wassermann and Kahn tests elicited no reaction, though it must be remembered that the patient had had two courses of antispecific treatment in 1920. Her blood urea content was 20 milligrammes per 100 cubic centimetres, and her blood creatinine content two milligrammes per 100 cubic centimetres. A blood count gave the following information: the erythrocytes numbered 3,630,000 per cubic millimetre; the hæmoglobin value was 60% (8·5 grammes *per centum*) and the colour index was 0·83. The leucocytes numbered 8,920 per cubic millimetre; 4% were eosinophile cells, 55% were neutrophile cells and 34% were lymphocytes. The blood sedimentation rate, estimated by Westergren's method, was 138 millimetres in one hour (normal, six to ten millimetres). The Frei reaction was positive. No microfilaria were found in specimens of blood collected at 10 a.m. and at 11 p.m. The total blood protein content was 11·3 grammes per 100 cubic centimetres of serum, the albumin content was 5·6 grammes per 100 cubic centimetres of serum, and the globulin ratio was 0·98. A piece of tissue from the vulva on the left side was examined microscopically and the following report was given:

> Normal epithelium. Connective tissue densely fibrous with lymphocytes. Small area with epithelioid type of cell.

Nothing specific was found in one of the inguinal glands which were removed.

As regards treatment, it is interesting to note that the cellulitis cleared up rapidly when applications of *Lotio Nigra* were made. The patient also benefited when she was given dilute hydrochloric acid, one drachm, three times a day. The elephantiasis of the clitoris and *labium major* has become more pronounced each week since the patient was admitted to hospital, and it is evident that surgical measures will soon have to be resorted to in the treatment of this condition.

A NOTE ON THE USE OF "NEO-SYNEPHRIN" IN COLLAPSE.

By Michael Kelly,
Bunbury, Western Australia.

The intravenous administration of "Neo-synephrin" in cases of severe circulatory failure, from whatever cause, might well prove to be an epoch-making discovery in medicine. This drug causes a widespread vaso-constriction. It closely resembles adrenaline chemically and in its physiological action; but, though much more stable, it is many times less potent in its action. It is procurable in a 1% solution, which can be sterilized by boiling. It is sold widely for its detergent effects on the nasal mucosa; I have a feeling that in a short time it will command a wider sale for its dramatic effects in circulatory collapse.

Shock is the manifestation of the removal of large volumes of fluid from the peripheral circulation by widespread vaso-dilatation. If this fluid still remains within the body, as when the collapse is not accompanied or caused by hæmorrhage or severe vomiting or diarrhœa, the most rational procedure would be to attempt to restore the fluid to the circulation by restoring vascular tone. Of late the massive infusion of physiological fluids has provided the first really effective weapon against circulatory failure. The work of Dr. Ian Wood in popularizing this measure and in perfecting its technique is now well known. By this means the blood volume is restored; this restoration is followed by improved nutrition of the vital centres. If these centres recover to a sufficient degree, vasomotor control is restored and the general vaso-dilatation is gradually overcome. But in many cases of severe toxæmic collapse or profound traumatic shock the infusion of fluids produces very little improvement in the pulse; all the fluids infused seem to pass out of the circulation immediately. The best results from venoclysis are seen in collapse accompanied by loss of fluid and in post-operative crises, in which this measure frequently proves life-saving, allowing a temporarily damaged vasomotor centre enough time to reassume control. If by any measure we could produce vaso-constriction, a still more power-

ful weapon would be added to our equipment, for the lost fluid would be restored to the circulation in a truly physiological manner. With this end in view Dr. Wood has lately been using "Neo-synephrin".[1][2] His favourable reports upon it have led to its use at local hospitals, with astonishing results.

"Neo-synephrin", given intravenously, causes an instantaneous effect upon the pulse, which becomes slow and full, and the patient immediately feels greatly benefited. This improvement can be continued indefinitely by continuation of the administration of "Neo-synephrin", which, if given in the correct dosage, appears to produce no ill effects even after prolonged administration. However, too rapid a rate of infusion should be avoided; it brings on the following unpleasant and alarming symptoms. Within a few seconds the patient becomes distressed and complains of an intolerable feeling in the head, and usually vomits. At the same time the pulse becomes exceedingly slow and very powerful. (No blood pressure records were taken.) When the rate of infusion is slowed down the symptoms subside, and the pulse, after a minute or two of slow coupled beats, returns to normal.

The rate of infusion recommended by Dr. Wood is 20 cubic centimetres in three or four hours, administered in one litre of saline solution.[2] In the writer's series the optimum rate appeared to vary according to the degree of collapse. In each case the rate chosen was that which produced the greatest improvement in the pulse without causing unpleasant symptoms. The rate in an average case of moderate collapse was about 1·5 to 2·0 cubic centimetres of 1% "Neo-synephrin" solution per hour for as long as was considered necessary. The technique is varied according to the need of the patient for fluid. If the need is urgent, one litre of fluid is administered rapidly, say in two hours or less, with three or four cubic centimetres of "Neo-synephrin"; and this rate may be continued. If the need is less urgent, eight to ten cubic centimetres may be given in one litre of fluid in five or six hours. If the patient is considered to have had enough fluid, 30 to 40 cubic centimetres are added to a litre of fluid, which is then given by a very slow drip over twenty-four hours or more. In these cases a reliable special nurse is required, who understands the dangers of too rapid a rate of infusion. In extreme degrees of collapse "Neo-synephrin" can be given at a very much greater rate (see Case IV).

It appears to be certain that the sole action of the drug is on the peripheral circulation, and that no harmful effects occur even after prolonged administration. J. B. Devine[3] lately issued a word of warning against overburdening an already labouring heart by adding to the peripheral resistance. Against this must be set the fact that the heart weakness in collapse is due entirely to the low peripheral resistance, which reduces the coronary circulation and the nutrition of the heart. Wright[4] states that the blood pressure is the main factor controlling the coronary circulation, a pronounced increase of pressure multiplying the volume of the coronary circulation many times. Therefore it appears that the increased peripheral resistance brought about by "Neo-synephrin" should benefit the heart rather than overburden it. "Neo-synephrin", if given at all, should be given in doses large enough to produce a sensible effect upon the pulse.

Reports of Cases.

Case I.—Within forty-eight hours of sustaining an apparently clean wound, the patient, a man, aged thirty-five years, had a scarlatiniform rash, a temperature of 106° F., and a pulse rate of 170 per minute. An immediate profound improvement occurred on the exhibition of "Neo-synephrin", the pulse rate dropping to 110 per minute within twenty minutes, and the patient, who had been vomiting and looking moribund, ate his next meal. The temperature was normal within twelve hours. On two subsequent occasions within a fortnight his temperature rose high and his general condition appeared precarious; on each occasion the exhibition of the drug was followed by a fall of temperature to normal within twenty-four hours. So great was the immediate subjective improvement that on the third occasion he pleaded for the institution of venoclysis. Sulphonamide compounds were given throughout in high doses (see Figure I).

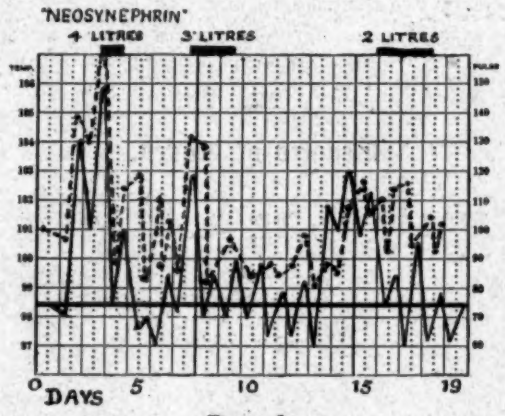

Figure I.

Continuous line represents temperature, interrupted line represents pulse. On the third administration the "Neo-synephrin" was given by an exceedingly slow drip and prolonged for forty-eight hours in spite of immediate benefit.

Case II.—The patient was a woman, aged thirty-five years. Profound collapse occurred within half an hour of the intramuscular administration of 20,000 units of diphtheria antitoxin. She had anaphylactic shock. The pulse was rapid and thready, and she had sighing respiration and bright red skin from generalized cutaneous vaso-dilatation. Great subjective weakness was present. The injection of 0·1 cubic centimetre of a 1 in 1,000 solution of adrenaline, given intravenously, caused the immediate appearance of the distressing symptoms referred to above. These passed off in a few minutes. Adrenaline given hypodermically produced no effect. The slow intravenous infusion of saline solution with "Neo-synephrin" was followed by immediate improvement in the patient's general condition and in subjective sensations.

Case III.—A man, aged seventy years, collapsed after prostatectomy. Within twelve hours he had three pints of saline solution with "Neo-synephrin", with great benefit. Administration of the saline solution was then continued without "Neo-synephrin" and his condition retrogressed.

When the drug was again added his condition immediately improved.

Case IV.—A man, aged sixty-two years, became pulseless after amputation of his arm for severe and prolonged sepsis. The outlook was hopeless, but "Neo-synephrin" was given as a last resort. It was found that ordinary doses of the drug produced no effect; therefore 90 cubic centimetres were added to a litre of saline solution and the effect of variation in the rate of infusion was observed. A slow administration produced no effect, but when the drip was gradually accelerated the pulse became perceptible and the heart rate, which had been 120 per minute, slowed down to 96. The patient immediately felt much better. The optimum rate of administration proved to be one litre in four and a half hours. Unfortunately the man died; but even up to the last an improvement in the pulse could be effected by an increase in the rate of administration.

The lesson to be learnt from this case is that there is no standard dosage for "Neo-synephrin"; the optimum rate must be found by clinical trial. It is obvious also that no harmful effects occur even after huge doses if immediate distressing symptoms are avoided.

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(1) I. J. Wood: Discussion, The Medical Journal of Australia, Volume I, January 21, 1939, page 122.
(2) I. J. Wood: "Some Observations upon Massive Intravenous Infusions with Physiological Fluids", The Medical Journal of Australia, Volume I, June 10, 1939, page 864.
(3) J. B. Devine: "The Three-Dye Treatment of Burns", The Medical Journal of Australia, Volume I, June 24, 1939, page 927.
(4) Samson Wright: "Applied Physiology", Fourth Edition, 1936, page 325.

Reports of Cases.

TWO CASES OF PRIMARY CARCINOMA OF THE URETER.

By A. T. H. Jolly, M.B., B.S.,

From the Pathology Department, Alfred Hospital, Melbourne, Victoria.

Ureteric carcinoma is a rare tumour, which, owing to lack of urinary symptoms combined with obscure metastatic deposits, may elude diagnosis. As in other carcinomata of the urinary tract, three varieties are commonly recognized: (i) papillary carcinoma with a villous appearance and transitional type of epithelium, (ii) squamous carcinoma with cell nests and cornifying epithelium, (iii) anaplastic carcinoma with disorderly undifferentiated cells. All stages of transition exist between these three groups, from both a pathological and a clinical point of view. (i) The first variety is only slightly malignant, infiltrating little or not at all, metastases usually occur late or not at all, and it is apt to cause profuse hæmaturia. (ii) The second type infiltrates early and also metastasizes to regional glands. (iii) The third type infiltrates early and may rapidly give metastases both by the lymphatics and by the blood stream, and it can be devoid of any local symptoms. The clinical pictures of the third group are many and variable, and diagnosis is often impossible. This paper records two such cases which were identified only at autopsy.

Case I.

Clinical History.

E.W., a man, aged fifty-four years, first attended hospital as an out-patient on November 30, 1938, complaining of left sacro-iliac pain following a strain. The radiologist reported the presence of spondylitis and sacro-iliac arthritis, with a probable fracture of the fourth lumbar vertebra. Three weeks later enlarged glands were noticed in both groins; during the next two weeks a fluctuant mass developed in the left loin and the axillary glands became enlarged. The patient was admitted to hospital on February 1, 1939, and biopsy revealed metastatic carcinoma. Twelve days later he died.

Post Mortem Findings.

A large mass of glands, eight centimetres in diameter, well defined and of fleshy consistency, had ulcerated through the right groin, where skin nodules had spread over the thigh. In the left inguinal region secondary glands and skin nodules were present to a lesser extent, without ulceration. The cervical and axillary glands were enlarged, but without skin nodules in their vicinity. Posteriorly, a mass was present in the left loin, 16 centimetres in diameter, lying behind the left kidney and ureter and infiltrating through all tissue planes to the skin, where nodules of tumour were present over a wide area. The left ureter lay amidst greatly enlarged cancerous lymph glands; the mucous membrane of the proximal two-thirds, which was opened with probe and scissors, was replaced by white cancerous growth, and the muscle coat was infiltrated and fused with surrounding tissues by the same. No hydronephrosis was present. The mesenteric, aortic, iliac and mediastinal lymph nodes were enlarged and contained secondary deposits. Both psoas muscles and adjacent lumbar vertebræ were invaded by direct extension from the lymph glands. Bronchopneumonia was present in both lungs. The liver, spleen, gastro-intestinal system, pancreas, kidneys, bladder, prostate, testicles, thyreoid gland, suprarenal glands, heart and brain were all normal.

Microscopic examination of a section taken through the ureter revealed no normal ureteric structure, the mucous membrane being replaced and the muscle coat infiltrated and destroyed by tumour cells. The cells are polygonal in shape, from 12μ to 18μ in diameter, with active hyperchromatic nuclei. Definite island groups of these cells point to their epithelial origin. Sections of secondary deposits in lymph glands display a similar arrangement, with scattered epithelial changes in an otherwise rapidly growing anaplastic carcinoma. A section through the skin nodules exhibits similar malignant cells invading the dermis.

Case II.

Clinical History.

A.M., a male, aged seventy-six years, was admitted to hospital on January 31, 1939, with a diagnosis of "secondary malignancy". Two years previously he had had a growth removed from his left cheek by radium. Six months prior to his admission to hospital he had noticed a lump in his left groin and some swelling of his left leg. No further history was obtained and he died soon afterwards.

Post Mortem Findings.

Craggy masses of hard tumour were palpable in the left side of the neck and in both groins. On dissection the neck tumour was found to be a fused mass of cancerous lymph glands, largest in the supraclavicular area. The left inguinal mass consisted of confluent glands, with widespread diffuse and nodular extensions in the tissue planes of the thigh and in a wide area of the skin of the thigh and perineum. A similar condition, but less in extent, existed in the right groin. The mass in the left groin was continuous with masses in the left iliac region and pelvis. The iliac and femoral veins were constricted but not invaded by the growth. In the lower half of the left ureter extensive cancerous replacement was observed and it was surrounded by large lymph glands containing secondary deposits. A carcinomatous plaque surrounded and followed the ureter onto the posterior wall of the bladder. Slight hydronephrosis of the left kidney was present. In the right ureter the mucous membrane and muscle coat were normal, but it was constricted by adjacent glands; slight hydronephrosis had resulted. One

metastatic deposit, one centimetre in diameter, was present in the right kidney. The right adrenal gland was replaced by a secondary growth, whilst the left contained a metastatic deposit, two centimetres in diameter. Direct infiltration from the lymphatic metastases was seen in the lumbar vertebræ and psoas muscles. In the lungs hypostatic pneumonia was present. The heart had calcified aortic cusps and coronary arteries. The testicles, bladder, prostate gland, gastro-intestinal system, liver, spleen, pancreas, thyreoid gland, trachea and brain were normal.

Microscopic examination of a longitudinal section at the junction of normal and malignant mucous membrane reveals on the malignant side undifferentiated cancer cells replacing mucosa and infiltrating the muscle coat, whilst the normal side is largely desquamated except for a few patches of transitional epithelium. The cancer cells are chiefly about 10μ in diameter, with large hyperchromatic nuclei. Microscopic examination of a section through a skin nodule reveals undifferentiated disorderly cells invading the dermis. In a section through a lymph gland the cancer cells are seen to be extensively replacing lymphatic tissue. A section through the metastatic deposit in the kidney displays similar anaplastic growth.

Discussion.

The two cases of ureteric carcinoma described present a close similarity in the type of carcinoma and in the distribution of their metastases. Neither case was diagnosed clinically, nor were there any symptoms pointing to a lesion in the urinary tract. A study of the morbid anatomy suggests that bleeding, if it had occurred at all, would not have been profuse; in this respect this type of growth contrasts with the more friable papillary or fungating growths. Reviews of the subject of ureteric carcinoma by Rousselot and Lamon and by Meeker and McCarthy describe the variety of symptoms and manifestations which this disease can cause, a variety which can be interpreted on pathological grounds.

Summary.

Two cases of carcinoma of the ureter are described. Both growths were pathologically similar, being anaplastic growths with widespread lymphatic metastases and numerous skin nodules. Neither gave any symptoms pointing to a ureteric lesion, and both were undiagnosed during life.

Acknowledgements.

I am indebted to Dr. R. A. Willis for help in the presentation of the cases, and to Dr. W. S. Newton and Dr. A. J. Trinca for clinical records.

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Reviews.

A TEXT-BOOK OF OBSTETRICS.

THE fifth edition of "The Queen Charlotte's Textbook of Obstetrics" will further enhance the reputation of this publication as a text-book for students and practitioners.[1]

As stated in the preface to the fifth edition, this new edition has become necessary mainly on account of the changes in the treatment of puerperal infections, and in the text a detailed account of the results of treatment by means of sulphanilamide is given. The mortality rate has been diminished by one-quarter. The whole chapter on pyrexia in the puerperium is very well presented; but we can find no mention of the value of blood transfusion in puerperal sepsis of some duration.

The chapter on Cæsarean section would be more helpful if the relative positions of the classical operation and the lower segment operation were more clearly defined.

The chapter on obstructed labour would be more valuable if all the causes of the condition as tabulated were dealt with in orderly sequence.

In the treatment of inversion of the uterus it is said that replacement is best carried out by firm pressure exerted by the knuckles of three fingers on the apex of the mass. We have known this method to fail, while success was obtained when the part of the inverted uterus which came down last was replaced first.

Students and practitioners will continue to find this publication adequate for their need.

[1] "The Queen Charlotte's Textbook of Obstetrics", by Members of the Clinical Staff of the Hospital; Fifth Edition; 1939. London: J. and A. Churchill Limited. Medium 8vo, pp. 685, with four coloured plates and 293 text figures. Price: 21s. net.

BACTERIOLOGY.

THE fifth edition of Bergey's well-known manual[1] is not merely a bringing up to date of the previous editions, now comprising descriptions of 1,335 species of bacteria, arranged in 122 genera, 26 families and seven orders. The book has been greatly improved by a thorough revision, through which numerous errors in the species descriptions in previous editions have been corrected, and the various genera have been arranged in a manner that seems to conform more closely to their natural relationship. A chapter giving a survey of the various systems proposed for the classification of bacteria has been added, and a new feature is represented by the appendices containing lists of names of organisms of doubtful identity, which have been attached to several genera. These appendices are a valuable addition to the book; but in future editions they might profitably be extended to include several organisms now given full species rank and description. Although there may thus be room for further improvements, the book upon the whole very well fulfils its purpose as a reference book for the identification of nearly all hitherto described bacteria.

[1] "Bergey's Manual of Determinative Bacteriology: A Key for the Identification of Organisms of the Class Schizomycetes", by D. H. Bergey, R. S. Breed, E. G. D. Murray and A. P. Hitchens; Fifth Edition; 1939. London: Baillière, Tindall and Cox. Medium 8vo, pp. 1043. Price: 45s. net.

A TEXT-BOOK OF MIDWIFERY.

IN writing a text-book of midwifery an author assumes a very difficult task and a grave responsibility, as the practice of this, the oldest art of medicine, is by no means standardized. In this work, "Midwifery", by ten teachers,[1] by a system of collective authorship, in which collaboration, consultation and criticism by all concerned have been freely utilized, the authors have succeeded in presenting a text-book which not only embodies the essentials and present knowledge of the subject, but contains a general account of the practice of obstetrics as carried out in the leading teaching centres in England. For this reason the book has proved very popular and has had a large sale in the United Kingdom.

The anatomy and physiology of pregnancy are briefly and concisely recorded. The chapter on antenatal care is well done and its importance in preventive obstetrics is stressed. The chapter on toxæmias of pregnancy contains little that is new, and still clings to the old classification and retains the term albuminuria of pregnancy. The section on breech presentations is clearly set out, and the subject of *ante partum* hæmorrhage is very well dealt with. It is interesting to note that in the majority of

[1] "Midwifery", by Ten Teachers, under the direction of C. White, M.D., B.S., F.R.C.P., F.R.C.S., F.C.O.G., edited by C. Berkeley, C. White and F. Cook; Sixth Edition; 1938. London: Edward Arnold and Company. Demy 8vo, pp. 888, with illustrations. Price: 18s. net.

cases the authors advise treatment by Cæsarean section for *placenta prævia*.

The chapter on contracted pelvis still retains more or less the old classification. More space might have been given to the commoner and more troublesome minor degrees of pelvic contraction. In dealing with the subject of puerperal sepsis the authors have given prominence to the recent advances in bacteriology and treatment. A fair amount of space has been given to infant feeding and the care of the new-born infant.

For the student preparing for the final examinations this is a very useful text-book, and by reason of its essentially practical nature should prove of value as a quick reference book to the practitioner. It is printed in large type and has numerous excellent illustrations.

THE ENDOCRINE GLANDS OF THE BRAIN.

This presentation of up-to-date knowledge concerning the endocrine glands of the brain, pineal and pituitary, by Dr. Paul Niehans, a Swiss surgeon, is admirably clear.[1] The marshalling of the facts indicates that the author is a teacher, and a certain didactic element inseparable from instructional publications is obvious; indeed the book has somewhat of the quality of the notes of a good coach. With each hormone there will be found succinct paragraphs dealing *seriatim* with history, histology, chemistry, occurrence, animal experimentation, clinical findings, under-function, over-function and therapy. The pituitary is credited with the production of no less than twenty-five hormones, though the author honestly admits that the existence of some of these must be accepted with caution. It is a sign of the times that the reaction of living plant tissues to several of these hormones is given mention. The portion dealing with the pineal body is not so satisfactory; that, however, is not the fault of the writer, but is due to the contradictory findings of experimentalists and observers.

We have but one objection to the book, and that unfortunately is serious: there is no bibliography and not a single reference to indicate the source of a fact, though occasionally the name of the investigator is given. For example, the reader comes upon a footnote, "the epiphysis of the ox contains fewer pineal cells than that of the bull", and might desire to follow this up or at least check the statement, but no idea is given of the authority. The book is clearly printed and the proof-reading has been excellent, only one minor slip having been detected.

THE NORMAL PROCESSES OF URINE FORMATION.

In the last of several concluding statements the author of a ponderous work in three volumes on the integrative nature of the normal processes of urine formation,[2] Dr. Ekehorn, of Stockholm, remarks that formerly the chaotic condition of renal physiology could hardly be described. The implication is that all has now been made clear by the laborious analysis of the facts which physiological research has accumulated. The author's own experimentation, by the way, bears to his exposition the same relation as the bread to the sack in Falstaff's famous bill. The reader who has patience to wade through 1,390 pages of heavy letterpress will assuredly find confusion worse confounded. The author has an irritating way of emphasizing by italics at least three sentences or phrases in each page, and these when examined will be found of little import and often not worth recording. Again, the number of summaries, conclusions and recapitulations is really exasperating, especially when these are set forth in very nebulous phrasing.

Great stress is placed on the part played by electrical attraction and repulsion in the selective absorption by the tubules, but the entire argument devoted to this hypothesis could be well presented in the limits of a couple of pages. An elaborate scheme is suggested for the localizing in the tubules of the absorption of each threshold and non-threshold ingredient of the glomerular filtrate. About the scholarship displayed in the work there can be no question, but the critical reader will feel that if the author had experimented more and philosophized less the book might possibly be worth perusal.

RHEUMATISM.

Bertram S. Nissé has written an interesting little book on rheumatism.[1] As the author is a member of the honorary medical staff of the British Red Cross Clinic at Peto Place, his work commands our attention. It is divided into three parts, in which he treats of rheumatic fever, fibrositis and arthritis respectively. The book bristles with definitions, clinical pictures, differential diagnoses and brilliant suggestions for general treatment, and particularly for local treatment. It is written systematically and should appeal strongly to medical students and to those general practitioners who like to follow the trend of classifications which, though they vary surprisingly as the years pass, present in a pithy manner the summaries of new ideation and progressive knowledge.

Rheumatic fever, otherwise referred to as acute and subacute rheumatism, is presented as a generalized systemic disease of infective origin, perhaps due to a filter-passing virus; the virus as the actual exciting cause is presumed to come into activity when the resistance is lowered by certain strains of streptococci. After stating that salicylates relieve pain and diminish feverishness, but are of little or no effect in preventing the onset of cardiac complications, Nissé advises the administration of twenty-five grains of salicylate of soda combined with an equal amount of bicarbonate of sodium or potassium every three hours at the onset of the acute attack in the case of an adult. The maintenance dosage advocated is ten grains three times a day until convalescence is well established. Children of twelve years of age should be given half the dose suggested for adults; they should receive "proportionately less if younger". Nissé outlines treatment and observation which, even in the absence of evidence of serious cardiac damage, should be continued for at least a year before the prognosis may be regarded as good.

Fibrositis is subdivided into three sections, in which are serial dissertations on panniculitis or fibrositis of the subcutaneous tissues; on fibrositis of the intramuscular and fascial tissues, the aponeuroses and tendons, the periarticular structures and bursæ; and on neuritis or neurofibrositis affecting the nerve sheaths.

Approximately half the book is devoted to arthritis or rheumatism affecting the joints. Rheumatoid arthritis is either the classical primary condition of unknown ætiology or the rheumatoid arthritis of infective origin which has been described under quite an imposing variety of names. The section on treatment is common to both and will rejoice the hearts of those who like to practise physical therapy and the use of vaccines; the possibilities are almost limitless, and Nissé has shown that he has had considerable experience of them and has made many practical observations of great value for the guidance of the less experienced. Osteoarthritis, otherwise known as hypertrophic, senile or degenerative arthritis, is also handled didactically by the author, and the book closes with similar treatment of the subjects of menopausal arthritis, gout and the regional varieties of arthritis.

[1] "Die Endokrinen Drüsen des Gehirns Epyphyse und Hypophyse ein Blick in ein Interessantes Gebiet", by P. Niehans, M.D.; 1938. Bern: Hans Huber. Super royal 8vo, pp. 280. Price: Schw. Fr. 10·50.

[2] "Über die Integrative Natur der Normalen Harnbildung", by G. Ekehorn, D.M.; Volumes I, II and III; 1938. Helsingfors: Mercators Tryckeri. Medium 8vo, pp. 1431.

[1] "Rheumatism", by B. S. Nissé, M.D., M.R.C.P.; 1939. London: John Bale Medical Publications Limited. Large crown 8vo, pp. 168. Price: 5s. net.

The Medical Journal of Australia

SATURDAY, OCTOBER 14, 1939.

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THE STATE AND MEDICAL RESEARCH.

In America most of the medical research is privately endowed; in Great Britain research is fathered chiefly by the State, for His Majesty's Government provides a substantial sum of money every year for the Medical Research Council of the Privy Council, which disburses the money as it thinks best. In Australia the National Health and Medical Research Council is provided with funds by the Commonwealth Government; but this council, as its name implies, has a dual objective and is therefore somewhat different from the official body in Great Britain. The work of the latter body was discussed in these pages in the issue of May 6 last in the light of its annual report for the year ended September 30, 1938. Attention was drawn on that occasion to the sums of money available to the council, to the type of investigation sponsored by it, and to its policy in the provision of money for individuals and not for institutions, that it might retain control over the worker and his investigation.

We have now received an Harveian Oration delivered before the Royal College of Physicians of London on October 18, 1938, by Sir Edward Mellanby, Secretary of the Medical Research Council.[1] The oration, which has the title "The State and Medical Research", traverses much of the ground covered by the council's report, but there are certain other aspects of the oration worthy of attention. Mellanby points out that probably the first instance of State support for medical research was provided by Charles I, when he allowed Harvey to make use of deer and other animals in the royal demesnes for purposes of study. He then shows that more and more men are endeavouring to follow Harvey's example, and that the radical changes and rapid advances in medicine during the last sixty years serve but to increase the appreciation of Harvey's foresight and skill. He states that in Great Britain and to a greater extent in the United States of America the increase in scientific research has had no special intellectual basis as far as the public, even the enlightened public, is concerned. This is doubtless true of Australia as well; but, rightly or wrongly, we have the impression that the public is gradually being taught the value of research by such means as broadcasting and exhibitions of scientific apparatus, and also by the evident results of research as applied to industry. Mellanby points out that research has been found to "deliver the goods sufficiently often" to deserve special encouragement. Even if, as he states, research applied to industry is the sprat to catch a mackerel of large profit, the achievements of research in industry may and should be used to capture the popular imagination and to direct it to research in human disease that does not immediately yield a large profit.

In regard to the State organization of medical research, Mellanby refers to the view held by some persons that such a system may lend itself to political influences of a kind which interfere or may interfere with the character of the work done or even give a bias to the results or to their interpretation. Obviously, he states, this possibility makes it necessary to have safeguards to prevent such a happening. In his experience political

[1] "The State and Medical Research", by E. Mellanby, K.C.B., M.D., F.R.C.P., F.R.S., K.H.P.; The Harveian Oration; 1939. Edinburgh: Oliver and Boyd. Demy 8vo, pp. 52. Price: 3s. 6d. net.

influence has never appeared, and even political interest has been uncommon. In spite of the work which has to be done by the Medical Research Council at the request of government departments, and which was mentioned in our recent discussion, he thinks it improbable that the ultimate results and deductions of work are ever influenced by political interest. He then makes a statement which should never be forgotten in any community in which medical or indeed any research is supported by State funds. Mellanby states: "If bias, due to this or other cause, once enters into any enquiry, this type of activity of the Medical Research Council will for ever be suspect and the Council's reputation as the purveyor of truth and the best available knowledge will be tarnished."

Other important aspects of research in Great Britain are mentioned by Mellanby—for example, the advantage of a change in personnel of the Medical Research Council, and the appraisal of new discoveries, and the proper payment of research workers so that they may pursue their investigations without anxiety or interruption. He also has something to say about the necessity for all medical practitioners, especially those not engaged in research, to be guarded in their criticisms of the discoveries of others. The facts of a discovery are seldom wrong, but their interpretation, and especially their first interpretation, is often wrong. Mellanby's oration, which should be read by everyone interested in scientific research, is not only a complete survey of the way in which the Medical Research Council organizes and directs its activities, but also shows that, if the supervision is wise, there is no incompatibility between State control of medical research and freedom of the investigator.

Current Comment.

SIR ASTLEY COOPER'S FIRST AMPUTATION AT THE HIP JOINT.

Medical practitioners in general find interest and amusement in stories from the history of medicine; but few of them find time to search through the old literature for themselves; most are content to have the stories revealed to them by the enterprise of others. But there is much more than mere amusement to be had from a study of the various periods in the evolution of medicine and surgery. And so we welcome Nils L. Eckhoff's discussion of the account of Sir Astley Cooper's first amputation at the hip joint and some other articles appearing in *The Lancet* in the early years of last century.[1] *The Lancet* first appeared on October 5, 1823, at a time when schools of medicine were inadequate, the times of operation were likely to be made known to favoured pupils only, and attendance at *post mortem* examinations was possible only by bribery of the hospital porters. Dr. Thomas Wakley, the editor, endeavoured to provide instruction for the less fortunate students and information for practitioners in distant parts by publishing lectures, descriptions of operations *et cetera*. *The Lancet* from its inception was a virile organ, as various passages quoted by Eckhoff show.

> We believed Dr. James Johnson to be a feeble gentleman, but we were not prepared for the degree of imbecility which he has displayed in a statement addressed by him to the Editor of one of the monthly medical journals. The singular obliquity of his perception is equalled only by his extreme irritability; he is truly a psychological curiosity.

If any further evidence of Dr. Wakley's disapproval of Dr. James Johnson is required, it should be provided by the following:

> Pathological Intelligence. Metastasis of an extraordinary fungus! Dr. James Johnson has removed from New Street, Spring Gardens, to Suffolk Place, Haymarket.

It is hardly to be wondered at that *The Lancet* was frequently sued for libel. Such a stricture as the following might well incite its victim to invoke the law:

> Malformation. The following case of misplaced viscera is particularly curious: . . . we anticipate, for example, that when a post-mortem examination of Sir William Blizard shall be instituted, that the liver of this bitter knight will be found in his cranium, for during the whole of Sir Wm.'s life, his mouth has been performing the office of a *ductus communis choledochus*.

Eckhoff goes on to quote in full *The Lancet's* report of Sir Astley Cooper's first amputation at the hip joint, at Guy's Hospital on January 16, 1824. The patient was a man, aged about forty years, whose limb had been amputated just above the knee some years before. The femur had "become diseased from the extremity of the stump up to the trochanter major", and the constitutional effects had been grave. Astley Cooper cut down to the femoral artery and ligated it about an inch and a half below Poupart's ligament; "but it was discovered, by passing the finger deep between the triceps and vastus internus, that the profunda was still pulsating and it was evident the profunda was given off higher than usual, which obliged Sir Astley to secure the femoral artery almost close to Poupart's ligament". The integument was divided by an elliptical incision, and then the muscles were severed. At this stage another ligature was applied on the inner side of the limb, and the operator sat

[1] *Guy's Hospital Reports*, January, 1939.

on the chair in front of the patient and waited a few minutes to see whether there were any bleeding vessels. The head of the bone was disarticulated without difficulty; two further ligatures were applied; "the integuments were brought together, and a suture applied to the upper portion; strips of adhesive plaster, and lastly a bandage were put over the stump". The actual removal of the limb took twenty minutes and the securing of the arteries and application of the dressings fifteen more. The patient became faint during the operation, but revived on the administration of wine and the admission of fresh air. We read that he "bore the operation with extraordinary fortitude; and after all was finished, he said to Sir Astley, 'that it was the hardest day's work he had ever gone through' to which Sir Astley replied, 'that it was almost the hardest he ever had' ". During succeeding days the patient was dosed freely with laudanum for pain in the stump. He suffered from fever and sepsis and a persistent diarrhœa; but by March 19 he was reported to be gaining strength and to have been out of bed in a wheel chair. The final note is as follows:

> August, 1825. This patient perfectly recovered, and is now living at the country residence of Sir Astley Cooper.

In the same volume of *The Lancet* there appears a letter from a student writing under the pseudonym of "Incisor". The writer questions the propriety of amputation at the hip joint, stating: "It has been impressed on us by our teacher, that there can be no proper case for amputating so high, and extracting the bone from the joint." He believes his teacher's arguments to be powerful; but, because proofs and actual preparations are "weak in their influence upon some fellow students, compared with what Sir A. Cooper's practice may effect upon their minds", he asks the editor to describe the condition of the limb after its removal and to state whether it was diseased higher than the lesser trochanter. The editor was unable to give this information, as the limb had not been exhibited to the spectators at the operation; but he took the opportunity of pointing out that the time at which operations were performed was important, as well as the mode of operating. He stressed the necessity for "a patient examination into the nature of the disease for which the operation is to be performed, and of the chances of amelioration a patient may possess, from a trial of different means on the complaint under which he labours". His comment concludes with the following words:

> We do not wish to discourage the performance of operations, when they are necessary; but we make these remarks on account of the misdirection which the minds of the students appear to receive from looking only at the *manner* in which the operator uses the knife, without ever inquiring into the *reasons* for which the operation is performed.

A century later students are still apt to acquire the wrong perspective.

At a later page in the same volume of *The Lancet* Eckhoff finds a report of an amputation at the hip joint performed by Mr. Syme, of Edinburgh, taken from *The Edinburgh Medical and Surgical Journal*. Mr. Syme, assisted by his "much esteemed and highly respected friend and instructor, Mr. Liston", performed the amputation in one minute. He did not ligate the femoral artery until after the limb had been removed. Mr. Liston controlled the hæmorrhage during the cutting by digital pressure. When the femoral artery had been secured the pressure was released, "and then", says Syme, "had it not been for thorough seasoning in scenes of dreadful hæmorrhage, I certainly should have been startled, . . ."

> It seemed indeed, at first sight, as if the vessels which supplied so many large and crossing jets of arterial blood could never all be closed. It may be imagined that we did not spend much time in admiring this alarming spectacle . . . the patient's safety required all our expedition; and, in the course of a few minutes, hæmorrhage was effectually restrained by the application of ten or twelve ligatures.

Unfortunately ascites appeared and the patient died in the eighth week after the operation.

Apparently there was a tendency in Scotland to compare Syme's lightning operation with Cooper's, to the latter's disparagement. *The Lancet* took up the cudgels on Sir Astley's behalf, declaring that Syme's operation was performed, "to say the least of it, most unskilfully". After drawing special attention to the appalling loss of blood, *The Lancet's* article proceeds as follows:

> Such are the details of this curious performance, and if we had permitted them to remain in our pages unexposed and uncondemned, *The Lancet* would no longer have been a fit instrument for the hands of medical practitioners . . . That Mr. Syme's operation was expertly performed all must readily admit; but that it was executed with judgement, will be as universally denied. Not a vessel was secured until after the head of the bone had been removed from the acetabulum . . . so that eleven vessels were bleeding at the time the twelfth was being tied; . . . we feel greatly surprised that the patient did not die while on the operating table. Mr. Syme acknowledges that he should have been startled if he had not been accustomed to scenes of dreadful hæmorrhage . . . We sincerely hope that Mr. Syme will never again expose a patient to similar risk, or himself to a repetition of such dreadful anxiety.

"Once again", says Eckhoff, "*The Lancet* turned the tables on those attempting to detract from Astley Cooper's reputation." We might add the argument in favour of Cooper that at any rate his patient was still alive.

Amputation at the hip joint is an operation that even now is not undertaken lightly. In the early years of last century, when sepsis attacked almost every wound and anæsthesia was unknown, it must have demanded more than ordinary courage from both the surgeon and the patient.

THE ROLE OF VITAMIN K IN JAUNDICE.

Vitamin *K* was first separated by Dam in 1934. The designation "K" (from *"Koagulations"*) was used by the Danish workers for this accessory food factor essential to the normal development of chicks. Almquist in 1938 investigated its use in checking the tendency to hæmorrhage after operations on

jaundiced patients, and found over a series of cases that it was eminently successful in the prevention of bleeding in cases of obstructive jaundice. It also finds a sphere of usefulness in combating the hæmorrhagic tendency which is observed in cases of external biliary fistula and in making patients so affected safer subjects for operation. Vitamin *K* is absorbed in adequate amounts only in the presence of bile salts, so that the two substances are always exhibited together. In the past calcium therapy by mouth, intramuscularly and intravenously immediately before operation has been the only weapon at our disposal in these cases. Recent work has added vitamin *K* to our equipment and the results so far recorded are most encouraging.

The mechanism of its action in obstructive jaundice is now believed to be as follows. The tendency to bleeding in jaundice is due to a low level of plasma prothrombin. This deficiency in prothrombin is due to a *K* avitaminosis resulting from the absence of bile salts in the intestine. The plasma prothrombin level can now be accurately determined by the method of Quick, and it is suggestive that although all jaundiced patients do not have a low prothrombin level, those who manifest the hæmorrhagic tendency are deficient in plasma prothrombin. These are the cases in which the exhibition of vitamin *K* raises the prothrombin level and checks the hæmorrhagic tendency. Vitamin *K* is given with bile salts by mouth, and the administration is continued till the prothrombin level is elevated to near the normal level.

Sources of vitamin *K* are alfalfa (lucerne), which yields a relatively high percentage of the factor, extracts of fish meal, spinach and cereals. It has recently been prepared from young wheat and oat plants, and, under the name of "Cerophyl", is prepared in Kansas. "Cerophyl" is a greenish powder easily administered in tablets or in capsule form, and is the product employed by J. E. Rhoads, who has made a review of the subject.[1] Some 15 grammes of "Cerophyl" are given daily by mouth for ten days before operation in selected cases, when the plasma prothrombin will usually return to its normal level. Bile salts are necessary for the absorption of vitamin *K*. Hence one of the bile salt preparations—"Desicol", "Bilron", "Decholin" or sodium deoxycholate— should also be given by mouth for some ten days prior to operation. A dose of about two grammes of "Bilron" daily with 15 grammes of "Cerophyl" appears to be effective dosage. Vitamin *K* is quite an inexpensive preparation, and it may be anticipated that it will soon be used as a preoperative routine in all cases of obstructive jaundice.

The amount of vitamin *K* absorbed would seem to be not the only factor in a low level of plasma prothrombin. Liver damage from various causes also plays a part in the reduction of the prothrombin percentage. Hepatic injury, as estimated by the bromsulphthalein test, appears to follow the use of the common inhalation anæsthetics and to be an additional factor in aggravating the hæmorrhagic tendency in these cases. There is still a great deal of hypothesis with regard to the relation of vitamin *K* to prothrombin. It would appear to be a precursor to prothrombin, but since the latter has never been isolated the question must be left unanswered. Vitamin *K* has, however, been thoroughly investigated in regard to its properties and has been separated in a crystalline form. It is a fat-soluble vitamin. As yet its mode of action is not adequately explained, but its synergic effect with bile salts in checking the tendency to post-operative bleeding seems undoubted.

[1] *Surgery*, May, 1939.

A PARATHYREOID SYNDROME.

In but three instances have clinical records been made of the occurrence in man of the symptoms and signs commonly associated with repeated injection of active parathyreoid hormone. W. A. Oliver has recently observed two further patients who were followed to autopsy.[1] One was a woman, aged fifty-seven years, who complained that she had lost weight and strength for six months. She had completely lost her appetite and had commenced to retch and vomit a few days before entering hospital. On arrival she was almost too drowsy to assist in the compilation of a history. Examination showed her tongue to be dry, her left kidney to be tender, and her urine to contain occasional granular casts and red cells. Her cerebro-spinal fluid had a raised chloride content, namely, 800 milligrammes per 100 cubic centimetres. Her blood urea content was also moderately elevated. Nine days later the patient died, after a period of increasing stupor and without any localizing clinical signs. At *post mortem* examination a brownish-yellow tumour, about the size of an almond nut, was found beneath the right inferior lobe of the thyreoid. The cut surface of the kidneys showed numerous small calcareous flecks. The bones were devoid of evidence of decalcification or cyst formation. The blood calcium content, apparently taken after death, was estimated to be 17·4 milligrammes per 100 cubic centimetres. Histological examination of the parathyreoid tumour showed it to be a "chief cell" adenoma. No oxyphile cells were seen. Calcification was present in almost all the parenchymatous organs, but especially in the kidneys, heart, stomach, lungs and liver.

The other patient described by Oliver was one year younger than the first, and suffered from vomiting, loss of weight, anorexia and pain in the chest. These symptoms had first appeared a year previously but had remitted temporarily. On examination the patient was dehydrated and drowsy. No particular signs of localizing value were detected. Her blood count revealed anæmia, and albumin was present in the urine. The blood calcium content was estimated to be 19·6 milligrammes *per centum*. At *post mortem* examination a nodule about the

[1] *The Lancet*, July 29, 1939.

size and shape of a large Brazil nut was removed from the side of the left lower lobe of the thyreoid. The swelling produced in the neck had been thought during life to represent a lymph gland. Histologically the same type of chief cell adenoma was discovered as in the first patient. Widespread and severe necrosis with fibre fragmentation and calcium deposition was present in the heart muscle, with surrounding cellular reaction. In the kidney, calcium deposition in the glomeruli, with giant cell accumulation and intimal hyaline degeneration, was prominent. In the lungs very widespread deposition of calcium was present in the interalveolar connective tissue.

In the absence of any definite objective cause of death as seen at *post mortem* examination, Oliver concludes that death was due directly to acute hyperparathyreoidism. Uræmia he excludes on the grounds of insufficient evidence in the *post mortem* appearances of the cardio-vascular system and in blood urea levels. Experimenters have suggested that death of such patients results from an extreme "chemical" disturbance, perhaps of water-electrolyte balance. Shelling and his co-workers (1938) have postponed death by the provision of fluids and fresh electrolytes. Oliver does not consider that the myocardium was sufficiently diseased to indicate a cardiac death, nor did the final symptoms indicate such a termination. The symptoms reported are similar to those recorded in earlier patients. Albright, Aub and Bauer (1934) consider that hypotonia, lassitude, constipation and loss of weight constitute a definite syndrome of hypercalcæmia. Further symptoms of serious import are drowsiness, fever and tachycardia.

Oliver has continued his report with a full account of the morbid anatomy of the affected viscera. The photomicrographs which are reproduced are very descriptive. He is inclined to the view that these lesions are the result of toxæmia from the excess of circulating parathyreoid hormone rather than of calcium. Whatever the exact significance of the pathological changes or the mechanism of the mode of death, it is clear that these cases represent a clinical syndrome which it should be possible to recognize before death. Suspicion of its presence calls for blood calcium estimations, radiography of the bones and kidneys, and clinical or surgical search for a parathyreoid tumour. One fact which strikes the reader is the absence of cystic absorption of bone or even of general decalcification—changes which are supposed to follow consistently lesser and non-fatal grades of hyperthyreoidism.

CARCINOMA OF THE AMPULLA OF VATER.

In the third edition of his well-known book on neoplastic diseases Ewing states that carcinoma of the ampulla of Vater arises in the corrugated mucosa of the ampulla and at the duodenal papilla. After making reference to cases collected from the literature, he states that except in very early cases it is difficult to determine the exact origin of these tumours. He mentions four possible origins—the termination of the common bile duct, the mucosa of the pancreatic duct, the ampulla proper, and the papilla. These tumours are very rare; they are of interest to pathologists on account of their rarity, their origin and their structure, and to surgeons from the point of view of diagnosis as well as of treatment. Attention may therefore be drawn to two cases recently reported.

The first case is the fifteenth in a series of duodenal carcinomata described by M. M. Lieber, H. L. Stewart and H. Lund.[1] In this instance the patient, a man, aged forty-six years, was admitted to hospital after having been ill for two months; he died three weeks after admission "of obstructive jaundice, incident to a small malignant polyp [*sic*] originating from the mucous membrane of the ampulla of Vater". The growth permeated the surrounding pancreas and muscular wall of the duodenum, but as far as could be determined did not involve the surface epithelium of the intestinal mucosa or of the common bile or pancreatic ducts. The second case has been reported by I. Foldes and F. W. Heyer.[2] They refer to the four possible sources of origin mentioned by Ewing; and they point out that the lesion is seldom considered when a clinical diagnosis is being made. By the time the patient comes to autopsy, they state, the tumour has attained such a size that it involves two or more of the four possible sources of origin that have been mentioned. The case reported by Foldes and Heyer is of interest since the patient was seen at an early stage of his illness and the lesion seen at autopsy was so small that an opinion as to its origin could be formed. The patient was a man, fifty-six years of age, who had been well one week before his admission to hospital, when jaundice appeared and became progressively more intense. Laparotomy was performed. The liver was enlarged and smooth and the gall-bladder was distended. Stomach and duodenum appeared normal. The head of the pancreas was slightly thickened, but no newgrowth was found. There was no evidence of calculi in the biliary tract. A diagnosis of hydrops of the gall-bladder due to cholecystitis was made and cholecystectomy and duct drainage were carried out. Operation afforded no relief and the patient died three weeks after his admission to hospital. At autopsy a lesion of the ampulla of Vater was discovered. Foldes and Heyer describe the microscopic appearances in some detail and reproduce photomicrographs of the condition. They point out that the terminal part of the common duct, the proximal part of the pancreatic duct and the mucous membrane covering the ampulla of Vater were entirely free of neoplastic growth. They state that if a duodenotomy had been performed the true nature of the condition might have been recognized. The practical bearing of this statement is obvious, but it is doubtful whether resection and anastomosis between gall-bladder and duodenum would have resulted in a cure.

[1] *Annals of Surgery*, February and March, 1939.
[2] *The American Journal of Cancer*, August, 1939.

Abstracts from Current Medical Literature.

RADIOLOGY.

Röntgenological Aspects of Spina Bifida Occulta.

R. J. Ditterich (*American Journal of Roentgenology*, June, 1938), on the basis of observations made in 53 cases of *spina bifida occulta*, states that the fifth lumbar vertebra is very rarely the seat of the condition, that malformation occurs most frequently in the upper sacral region, particularly the first and second sacral segments, and that in this location it may assume the form of an incomplete fusion of the posterior neural arch. The last mentioned is by no means the most common type of defect which is recognized as *spina bifida occulta*. Most often it is possible to find that the laminæ of the first sacral segment are fused in the mid-line and below that level, and involving the laminæ of the first or second sacral vertebræ or both, small defects are visible. These vary in size from two to three millimetres; they are round, oval or irregular in shape, and they are sharply or dimly outlined against the background of the bodies of the sacral vertebræ. They are usually situated more conspicuously on either side of the mid-line and are frequently multiple. It might thus be said that the anomalies which are here designated as *spina bifida occulta* are sharply delineated with regard to location, but show a wide range of variation with respect to size, shape and number. In general it is safe to state that the term *spina bifida occulta* is applicable to any congenital defect of the laminæ of the upper sacral vertebræ. In combination with the bony malformations it is in practically all cases possible to demonstrate certain features within the spinal canal which are undoubtedly instrumental in disturbing the function of the sacral nerves. These consist of (*a*) masses of fat tissue, in contact with the nerve roots of the *cauda equina*, and (*b*) bands of fibrous tissue, extending between the ventral surface of the laminæ and either the dura or the nerve roots. The deposits of fat tissue are usually found at the level of the first, second and third sacral segments. They are in close contact with the dural sac laterally and sometimes dorsally; distal to the dural sac they envelop the nerve roots of the cauda. It is easy to understand that such an abnormal arrangement of tissue may bring about an impairment of function of the nerves which are involved. From experience in this series it is evident that such alterations are not only very common, but that they are found in a large variety of clinical pictures in which they have not been suspected. Concerning the relationship between the pathological findings and the radiological appearance, it may be said that whenever the bony defects are demonstrable in the skiagrams it is practically certain that the intraspinal changes are also present. Among the clinical conditions which have been found to be combined with such abnormalities are muscular rheumatism, low back pain, spastic paralysis, infantile paralysis and hæmatogenous osteomyelitis. The results of treatment by surgical removal of these harmful influences are variable, though in some of the clinical pictures they are sufficiently striking to justify further application of this form of therapy.

X Ray Evidence of Tuberculosis in Supposedly Healthy Persons.

C. F. Baker and W. J. Marquis (*Radiology*, July, 1939) state that the tendency for employers, hospitals, schools for nursing and colleges to require the production of skiagrams demonstrating healthy lungs before the acceptance of workers and students is increasing. They have made radiological examinations of the chests of 4,662 applicants for employment. They state that the ideal healthy lung is characterized by the following: (*a*) a smooth diaphragm without indications of thickened pleura in the costophrenic angles, (*b*) absence of thickened pleura at the apices, (*c*) vascular markings of normal density and distribution, (*d*) absence of cloudiness in any portion of the parenchyma, (*e*) lack of mottling from nodule formation, (*f*) absence of calcific deposits, (*g*) absence of increased hilus densities, (*h*) absence of healed lesions of any type, (*i*) heart and aortic shadows which are within normal limits. Among the 4,662 applicants for employment, 41 persons (0·88%) were found to be suffering from adult tuberculosis; the percentage with a "probably active" lesion was 0·49, and with a "probably cured" lesion 0·39. Other abnormalities of the lung were discovered, the total percentage of abnormalities in these organs being 1·24. The authors conclude that the public health would be better if the lungs of so-called healthy persons were examined periodically by X rays.

Concrete as a Protection against X Rays of High Voltage.

G. Singer, L. S. Taylor and A. L. Charlton (*Radiology*, July, 1939) have investigated concrete as a protective material against X rays of high voltage. They give a description of relative X ray transmission measurements on a group of specially prepared concrete specimens and commercial building blocks selected to sample the concrete mixes and to cover the range of concrete densities in common use. They found that the lead equivalent of any concrete was an increasing function of its mass per unit area and independent of the nature of the mix. Relations between lead equivalence, density, mass and thickness are given; and from these the thickness of concrete necessary for adequate protection can be calculated for any voltage between 200 and 400 kilovolts. The authors point out that the thickness of the concrete barrier which will provide adequate protection at, say, 400 kilovolts is not very much greater than that required to give protection at a much lower voltage. Thus the thickness of concrete required at 400 kilovolts is about 26·5 centimetres, while the required thickness at 200 kilovolts is 22·0 centimetres.

The Upright Position and Radiography of the Gall-Bladder.

R. Spillman (*Radiology*, July, 1939) draws attention to the value of the upright position in radiography of the gall-bladder, previously described by Åkerlund, Eliasz and Bernstein. He reproduces two skiagrams, one taken with the patient in the horizontal and the other with the patient in the upright position. The radiolucent appearances in the latter picture are the result of the gravitation to the fundus of the viscus of the contents of highest specific gravity, whether gall-stones or bile. In certain cases there is a collection of minute gall-stones, comparable in size to "canary bird sand", of lower specific gravity than the bile in the most dependent part of the gall-bladder, and of higher specific gravity than that in the uppermost part of the gall-bladder. When the patient is in the upright position this collection forms a radiolucent layer somewhere between the upper and lower end of the gall-bladder; when he is in the prone position it is entirely lost in the shadow of the dye.

PHYSICAL THERAPY.

Direct Irradiation of Neurological Tumours during Operation with Low Voltage Radiation.

J. R. Carty and B. S. Ray (*Radiology*, March, 1939) have studied the effects of low voltage irradiation on the normal dog's brain, and describe clinical experiences in the treatment of twelve patients suffering from brain or cord tumours, with particular reference to any reaction which might be interpreted as the result of damage to normal structures. They used a mobile, self-rectified, oil-immersed, shock-proof plant, giving a voltage of from 30 to 100 kilovolts peak and capable of delivering 2,000 *r* measured in air at 20 centimetres' distance in 20 minutes. In their experiments with dogs the brains of three groups of animals, after resection of portion of the right parietal region of the skull, were treated with different dosages of low voltage radiation, namely, 6,000, 12,000 and 18,000 *r*, all at 60 kilovolts peak. No filter was used, and dosage measurements were made with a "Victoreen" *r* meter. The authors

conclude that the dog's brain can stand dosages up to 12,000 *r* units at low voltage without showing clinical effects, or more than minor microscopic changes. With a larger dosage, it was demonstrated that with low voltage the depth intensity of the rays was limited, as indicated by cellular changes, and there was comparatively little scattering effect outside the limits of the direction of the beam. The authors have also treated in the operating theatre, through the open wound, six tumours of the brain and six tumours of or about the cord. Usually the dosage of 2,000 *r* at 60 kilovolts peak, at a distance of 20 centimetres, was used. One patient was given 6,000 *r*. In several cases sections were taken from the tumour before or immediately after treatment. Extensive excision of as much of the tumours as possible was carried out prior to the X ray therapy. The longest period of observation was one year. Two of the patients with cord tumour and one with brain tumour developed unexplained fever; this persisted in the case in which a dosage of 6,000 *r* was given, but was temporary in the others. No reactions were noted which could be attributed to brain damage from the irradiation. Definite tumour cell destruction was noted within twenty minutes after the beginning of irradiation.

Radium Treatment of Cutaneous Cavernous Hæmangiomata.

M. Strandquist (*Acta Radiologica*, April 29, 1939) states that the principal aim of the treatment of hæmangiomata is cosmetic, that is, the entire disappearance of the lesion without visible scar or atrophy of the skin. From this point of view the radiological treatment of these lesions is superior to all other methods at the present time. This article is a report on the treatment of cavernous hæmangiomata by γ radiation. The origin and development, clinical features and differential diagnosis of these tumours are discussed. The paper covers 300 cavernous hæmangiomata treated at the Radiumhemmet, Stockholm, in 1936 and 1937. The lesions occurred on all parts of the body, but were most common in the skin of the face and scalp. More than two-thirds of the patients were females. A good method for the treatment of very superficial hæmangiomata is the use of β rays. But if the lesion has any appreciable thickness the use of γ radiation at a short distance from the skin is advisable. It is important in surface γ ray therapy that the radium-skin distance, if short, should be measured exactly in millimetres. To ensure that the radium-skin distance is constant the radium tubes in these circumstances are placed in specially constructed thick-walled glass capsules and several of these may be placed side by side to form a flat applicator. The intensity of radiation can then be calculated in *r* units and confirmed by measurements by "Sievert" condenser chambers. The treatment time is a few hours only, and the author regards the average dose through a layer of one centimetre of superficial tissue as being of more value in treatment than the surface dose. A perfect result will almost always occur after a single dose of treatment, with a maximum average dose of 800 *r* given during the first three months of life. This was so in 94% of the present series; in the remaining 6% two treatments only were necessary.

Lympho-Epithelioma in the Naso-Pharynx.

F. C. W. Capps (*Journal of Laryngology and Otology*, March, 1939) reports on eight cases of lympho-epithelioma in the naso-pharynx which have come under his care, the pathological diagnosis in each case being given by Professor Cappell. The early symptoms noted were deafness present in five cases, partial nasal obstruction in three cases, swelling in the neck in four, and pain on swallowing in one. It is important that patients presenting any of these symptoms or with neuralgia involving the lower two divisions of the trigeminal nerve should be examined by posterior rhinoscopy at frequent intervals. Gardham has described the primary tumour as being commonly small and sessile, and lying in the lateral wall of the pharynx in the region of the opening of the Eustachian tube. The secondary glands in the neck are "rubbery" hard and resemble tuberculous adenitis or lymphadenoma. In treatment radiotherapy would appear to be the obvious choice, and the author is convinced that external irradiation should be used first. The deep X ray therapy technique as used at Saint Bartholomew's Hospital, the Finzi six-field method, is described. If external irradiation fails to eradicate the tumour completely, the question arises of supplementing the dose by the application of radium or radon. The importance of cooperation between the surgeon and a fully staffed radiotherapeutic clinic, including a physicist, is emphasized. Prognosis appears to be bad; but Munro Black concludes that if a good local result is obtained and the patient passes the three-year limit without distant metastases, the outlook would appear to be good. In this series of cases one patient is alive and well after three and a half years, and one after just over two years. The remaining six were all dead within one year of being seen.

Post-Operative Use of Radium for Nasal Polypi.

W. A. Ford (*Archives of Physical Therapy*, April, 1939) has used radium for the past fourteen years in the post-operative treatment of nasal polypi. He advocates it particularly in recurrent polypi involving the ethmoid labyrinth, anterior and posterior. The polypi involving other sinuses can be dealt with by surgery alone. There is an allergic factor in the causation of these recurrent ethmoid lesions, and not infrequently an hereditary tendency is found. Complete removal of all polypi and degenerated tissue is the first step in treatment. It is not necessary to do more than curette the ethmoid area and remove larger pedunculated polypi projecting into the nose; and then radium will deal with the smaller polypoid masses. The author uses four "Monel" metal radium tubes, of wall thickness 0·4 millimetre, the radium being enclosed in platinum cells of about 0·1 millimetre thickness within the tubes. Each tube contains 12·5 milligrammes, and two tubes are used on each side. A few days are allowed to elapse after the surgical procedure to allow partial recovery of the operated tissues. Two tubes are then wrapped together in dental rubber and in a thin layer of absorbent cotton and placed under each middle turbinate after cocainization and held in place by packing. Threads attached to the radium are looped securely over the patient's ears. The radium (50 milligrammes in all) is left in on the average for about two hours; and the procedure is repeated at three to six week intervals until from five to eight treatments have been given. Sixty patients have been treated by this method and the results have been extremely favourable.

Treatment of Female Endocrine Disorders.

J. Kotz and E. Parker (*Radiology*, July, 1938) state that knowledge of the glands which control the female sex function is perhaps more advanced than knowledge in any other field of endocrinology; and they point out that the abnormal function of one gland is usually accompanied by decreased function in some of the other glands of the endocrine system, with compensatory hyperactivity in others. For these reasons organotherapy is not sufficient treatment for functional disorders of the female; in addition the authors advocate irradiation of the pituitary gland. They select this gland because they regard the pituitary as the master gland of all the endocrines; and they believe that the causes of most female functional disorders differ from each other more in degree than in kind. They lay stress on the statement that a thorough investigation should be made for any pathological change, either local or systemic, before endocrine therapy is given. The conditions cited as suitable for this treatment are amenorrhœa of ovarian failure, functional bleeding, dysmenorrhœa, menopausal syndrome and sterility; and examples of cases are given in which a combination of irradiation of the pituitary gland with appropriate hormone preparations has been used. Of 115 patients suffering from disorders of various types, 76·3% were relieved, 19·3% were improved, and in 4·4% of cases treatment was a failure. The technique and doses of X ray therapy used are not stated.

Special Articles on Civilian War Casualties.

II.

THE GENERAL ORGANIZATION OF THE PROFESSION IN A NATIONAL EMERGENCY.[1]

The subject requires consideration as to (*a*) the nature of the national emergency, (*b*) the various Government authorities which are concerned, (*c*) what steps have been taken up to date, and (*d*) some suggestions as to certain difficulties which must be faced if a satisfactory organization is to be brought into being.

Nature of the Emergency.

We all realize that we are asked to prepare an organization to deal with an emergency whose scope and extent are to a large extent matters of conjecture. The main purposes for which we are asked to organize the profession are: (i) to deal with the maximum number of civilian casualties which military experts suggest as being possible from raids on our country, and (ii) to provide adequate medical service for the civilian population in the whole State in time of war.

I do not consider that an organization for the profession to deal with a major war in Australia would come within our province, as in such circumstances the whole of the essential services, including medical, would pass under the control of the Commonwealth Government.

In the Great War the organization of medical services presented no great difficulties, as all medical men serving were officers in the Army Medical Corps and proceeded overseas, and care of the civilians was left in the hands of the doctors who remained in Australia.

In the event of air raids civilian casualties will probably be more numerous than soldier casualties. It is therefore essential that there should be some organization for dealing with civilian casualties.

Government Authorities Concerned.

In the last war the Commonwealth Government was the only authority vitally concerned in the conduct of medical services. In the war emergency for which we are asked to prepare ourselves, the Commonwealth Government, possibly because its constitutional powers are limited, has decided that the army medical service—that is, the medical care of soldiers and the treatment of soldier casualties—is its responsibility; but it has informed the State Governments that all preparations for the protection of the civilian population and the treatment of civilian casualties is a State responsibility.

The State Government in its turn has had to decentralize some of its powers and has informed the municipal authorities that they are responsible for the citizens in their own municipality in such matters as air raid shelters, decontamination of buildings, and the appointment of wardens to organize the whole personnel engaged in air raid duties.

Similarly, the large public utilities, such as the Electricity Commission, the water and sewerage boards throughout Victoria, large undertakings like gas companies, have all been asked to make plans for meeting an emergency, and all have willingly undertaken this task. Certain duties have been undertaken by the Police Department, such as arrangement of warning signals, enrolment of special constables, and the Fire Brigade has made plans for extending their vital and necessary services.

It has sometimes been asked why municipalities have been requested to undertake such a large part of the organization. The reason is that the municipalities are responsible elected bodies with specific powers given to them by law. They are therefore in a position to take over buildings compulsorily and do many things that a voluntary society would be unable to do. They have also a permanent executive staff; they can arrange for committee rooms, clerical assistance, and each municipality is by law compelled to have expert officers in the way of an engineer and a medical practitioner attached to its staff. Moreover, many enthusiastic individuals were organizing a number of societies throughout Victoria to provide emergency services in time of war. It was impossible to draw up an orderly scheme if private individuals had a right to enrol members without any method or plan of cooperating with Government authorities or existing services.

[1] A lecture delivered under the auspices of the Melbourne Permanent Post-Graduate Committee on July 20, 1939.

Steps Taken Up to Date.

As you all know, the military medical authorities issued a *questionnaire* to all registered medical practitioners, asking them to complete the form, showing their age, qualifications, whether they were on the active list or army reserve list, and for what service they would be prepared to volunteer. This *questionnaire* has been completed and the whole of the cards from which the information was obtained have been tabulated, and we now have a complete list of all medical men who are available for service. By this means we know which medical men will be immediately called up should war occur. It will be possible to plot a map of the areas from which these medical men have been called up, and it will show if any portion of this State is likely to be deprived of necessary medical service. I understand that approximately 500 men have not yet completed the *questionnaire*, and it would be a great advantage to the State if those who omitted to fill in the *questionnaire* would do so.

In the case of emergency any authority given power to control medical services for the civilian population will have information as to the medical men available and their qualifications, and the task of allotting them to the right posts should not present great difficulties. After the experience of the last war it certainly will be a reflection if medical men with special knowledge are allotted to duties in which their knowledge will be wasted.

Nursing Services.

In this State the Nurses Board is the constituted authority for dealing with registered trained nurses. Professor Marshall Allan, the Chairman of the Board, has already sent out a *questionnaire* to nurses on the same lines as the medical *questionnaire*, and replies have been received and are being classified. Many trained nurses who have retired or married can by this means be brought into an emergency service. Some of them will undoubtedly not be able to devote full time to nursing duties, but their assistance will be valuable in the time of emergency.

Ancillary Medical Services.

The Red Cross Society has done invaluable work in arranging for a course of training in nursing, cookery, first aid *et cetera* for men and women who are prepared to give their services in time of war. Some of these services, such as the Voluntary Aid Detachment, are for service in the Australian Army Medical Corps, but all their other trainees will be available for civilian services.

It must be remembered that the Red Cross members commenced their training long before most other authorities undertook the task. The Red Cross authorities have been most willing to fit in with a planned scheme for the whole State and have arranged to organize their units on a municipal basis, so that complete knowledge of the numbers of trained men and women available in each municipality is known, and they are incorporated with all other municipal air raid precaution work.

The Red Cross Society also offered to train and man all first aid posts. The Saint John Ambulance Association has also undertaken to organize the necessary ambulance services. Ambulance services cannot be organized on a municipal basis, as ambulances must be mobile and be quickly sent to any area attacked.

Municipal Organization.

The medical services in each municipality are to be under the control of the medical man who is called the Area First Aid Commandant. It is proposed to establish first aid posts manned by trainees of the Red Cross Society, both men and women, who must all have the certificate of qualification in first aid work and also the certificate of having undergone the course of gas training. Each post is to have a medical officer attached to it.

In the dangerous areas it is proposed to establish one first aid post for approximately 20,000 of the population. The main idea of the establishment of first aid posts is that by rendering first aid to lightly wounded or panic-stricken people the first aid post would save the out-patient departments of hospitals from being inundated with large numbers of persons suffering from minor injuries.

In addition it is proposed to have first aid parties equipped with motor transport, which will be able to render first aid on the spot and also to direct the seriously wounded to hospitals or the minor injuries to the first aid station.

Gas Training.

The training of persons in the methods of dealing with a gas attack and the use of gas masks has been undertaken by the Fire Brigade and the Police Department, who each have qualified instructors.

There may be some criticism of the necessity of gas training. Most of us derive our opinions as to the possible use of gas on our reading of what is happening in other countries, particularly Spain and China, where gas has not been used. In England, on the other hand, very extensive preparations have been made to meet gas attacks, and gas masks have been issued to all inhabitants and an intensive course of training in their use has been carried out. The English must therefore have very definite information that gas is likely to be used in any attack on their country.

In Australia we do not know whether gas will be used or not, but if we were to neglect the training of people to deal with gas attacks we should obviously be inviting such an attack. In a totally unprepared population gas attacks would be liable to give rise to serious panic, and therefore the training of a nucleus of people who understand something about the effects of gas and how to treat gas injuries is very necessary. In Australia we have such a nucleus in all firemen, policemen, key men in industries, key men in municipalities, and large numbers of members of the Red Cross Society and Saint John Ambulance Association.

Some Difficulties in the Organization of the Profession.

Many of us are on the army medical reserve list and have also volunteered for civilian duties. The army must have all the medical men it requires, and the authority in control of them will be the Commonwealth Defence Department.

Unless we have some system of compulsory service, in which all doctors are included, it will be impossible to have one governing authority for the whole body, who would allot some to military duty and some to civilian duty, and some partly for military service and partly for civilian service. In the absence of any compulsory powers it is obvious that a satisfactory arrangement for a civilian medical service can be carried out only if army medical authorities work in the closest cooperation with any authority set up to control civilian services. Without such cooperation some portions of Victoria may quite easily be deprived of essential medical services.

An organization has already been provided for the coordination of military and civilian medical services. The Commonwealth Government has appointed a committee, consisting of the heads of all the army medical services, army, navy and air force, with the Director of Health and representatives of the British Medical Association.

Each State, at the request of the Commonwealth Government, has appointed subcommittees consisting of the Director of Army Medical Services, who is *ex officio* chairman, two representatives of the British Medical Association, the chief health officer of each State, and in those States in which the hospital services are not under the health department, a representative of the governing authorities of the hospitals—in this State the Charities Board. These committees have been entrusted with the task of providing for the medical needs of both soldiers and civilians.

H. N. Featonby, M.B., Ch.B. (Melb.), D.P.H. (Cantab.), Chief Health Officer for Victoria.

British Medical Association News.

SCIENTIFIC.

A meeting of the Victorian Branch of the British Medical Association was held at Bendigo on July 15, 1939. The first part of the meeting took the form of a number of clinical demonstrations by members of the honorary staff of the Bendigo Base Hospital and was reported in the issue of September 9, 1939.

Surgical Methods in the Treatment of Pulmonary Tuberculosis.

Dr. F. J. Colahan read a paper entitled "Surgical Methods in the Treatment of Pulmonary Tuberculosis" (see page 561).

Dr. A. M. Hutson read a paper entitled "Surgical Methods in the Treatment of Pulmonary Tuberculosis, with Special Reference to Thoracoplasty" (see page 565).

Dr. John O'Sullivan stressed the importance of the radiological control of the surgical treatment of pulmonary tuberculosis. Its most important contributions were the diagnosis of the condition and the accurate localization of the lesions, and then, a very important point, the decision as to whether cavitation was present. The routine postero-anterior, lateral and antero-posterior views were of diagnostic and conclusive value in many cases; in this respect Dr. O'Sullivan stressed the importance of the antero-posterior view especially in upper lobe lesions. He said that the involvement in these cases was nearly always found on the posterior aspect of the upper lobe. He stressed the importance of clear sharp films, and pointed out the misleading value of films made with small machines and with indifferent technique. In his own work he employed a rotating anode tube with shock-proof tubes, with a milliamperage of 300. He also used a moving wafer grid to get rid of secondary radiations, and employed exposures timed to vary between a fifteenth and a thirtieth of a second.

Dr. O'Sullivan went on to say that in chest work especially it was important to have efficient apparatus. In spite of all the refinements in technique it was found that very often cavitation in the lung escaped demonstration radiologically, and no definite pronouncement could be made as to its presence or absence. With the development of tomography, however, it had been possible to obtain photographs of layers of the body of varying thickness, with the exclusion of the superimposed and underlying layers. Dr. O'Sullivan said that he would not weary the meeting with technical details. The method had been applied to the radio-diagnosis of lesions of the skull, spine, chest and other portions of the body; but it was in the chest especially that the method had been of value in the diagnosis and localization of cavitation and infiltration. Before proceeding any further Dr. O'Sullivan said that he would like to emphasize the fact that it was due to the initiative of his friend and colleague Dr. Douglas Thomas that the first tomograph had been brought into Australia. Dr. O'Sullivan wished to pay

a tribute to his work, together with that of Dr. Keith Hallam, in developing this method of diagnosis.

At this stage Dr. O'Sullivan showed a series of slides and tomographic films; he pointed out in each instance that the latter allowed the lesions to be seen much more clearly than the plain skiagrams.

Dr. K. H. Hallam said that to those not actively engaged in surgery but interested in the ramifications of thoracic pathology, the papers of Dr. Colahan and Dr. Hutson had been extremely interesting and stimulating, because they covered so much ground. The cavity was the *pièce de résistance*, literally and figuratively, in the surgical treatment of pulmonary tuberculosis, and in spite of the brilliant work of Corylios and others with the cavernoscope, with which direct inspection of cavities could be made, radiography was still the standard method for the examination of cavities. In consultation with the physician the radiologist could assess whether the cavity was of the high-pressure, thin-walled, closed type or the low-pressure, open, thick-walled type, which often contained fluid. Knowing that the former was easy to cause to collapse and the latter difficult, the physician could direct his energies according to the problem.

Dr. Hallam went on to describe tomography in some detail; he stressed the point that many cavities which were obscured in ordinary films by thickened pleura, fibrous and collapsed tissue in the lungs, and fluid in the pleural cavity, could be demonstrated easily and readily by tomograms. In tomographic films sections only of the thorax were in focus.

Dr. Hallam then said that the criteria of cure or amelioration of pulmonary tuberculosis after surgical procedures were three. The first was flexible but was unaffected by advances in medical science. A feeling of well-being and the ability of the patient to return to work constituted evidence which relied on the patient's subjective symptoms and the clinical acumen of the physician. Closure of the cavity and conversion of the sputum from "positive" to "negative" were the other two postulates. These criteria relied on laboratory methods; because of improvement in these methods past statistics had become invalid, and students of the literature on the results of surgical methods in the treatment of pulmonary tuberculosis had to recognize this fact. Tomographic methods had revealed cavities where cavities were considered not to exist, so that statistical data could be accepted only when tomography had been employed, if the cavity was stated to have closed.

Much more important, however, was the third desideratum, namely, freedom of the sputum (if any) from tubercle bacilli. Dr. Hallam had been stimulated to mention this subject by the teachings of Dr. R. Webster, who had impressed on members of the Melbourne Pædiatric Society that culture of sputum for tubercle bacilli was much more efficient than examination of the direct smears. A typical excerpt from the literature on the subject showed that in a large series a mere 20% of the specimens of sputum were found by smear to contain tubercle bacilli and 89% were found by the culture method. This huge discrepancy demonstrated that statistics based on smear examinations only were invalid. Dr. Hallam said that in the light of these developments it had to be recognized that in thoracic surgery, which required great surgical intelligence and technical ability, advanced technical methods of investigation had to be employed in order to substantiate claims to amelioration or cure.

Dr. C. H. Fitts, after thanking the previous speakers for their very informative addresses, said that the subject of thoracic surgery carried very wide implications. There had appeared in *The Lancet* in 1938 a paper by a physician concerning the results of non-operative treatment of hæmorrhages from the stomach. Later in the same year another paper had appeared, written by a surgeon, stating that the optimal time to operate was within forty-eight hours of the hæmorrhage. Finsterer had reported a mortality rate of 5%. There appeared to Dr. Fitts to be something wrong with both the purely medical and the purely surgical outlook. The evolution of specialization would be shown by the development of thoracic surgery. Dr. Fitts thought that the thoracic surgeon of the future would be a highly trained physician. There had to be a base line to work from, and "doing nothing" was that base line. From that state of expectancy and observation the management rather than the treatment would be planned. Dr. Fitts then considered what happened in pulmonary tuberculosis when rest alone was employed. He said that if the condition were bilateral the position was not hopeless, and many did not realize how much could be done by rest alone. Surgical treatment was merely an incident in the management of a long chronic disease. Physicians must not give the surgeons only the patients who were going to die; many of those with cavities would die within five years. Judgement was required as to the right time to interfere surgically. He went on to say that a patient might prefer to avoid the risk of operative interference. The possibilities were: (*a*) immediate death as the result of the operation, (*b*) survival after the operation, but no material improvement, (*c*) operation with improvement or prolongation of life, and (*d*) complete cure, but only after the passage of a number of years.

Dr. Fitts went on to say that, in his opinion, in ten to twenty years' time the operation most favoured would be partial thoracoplasty. He had been impressed by the value to the physician of the tomographic method of radiographical investigation. He did not believe that every cavity failed to close without surgical intervention. He knew of some patients who had had cavities but were back at work and had been in good health for at least five years. It was a wise and helpful practice to study cavities over long periods of time by means of tomography. Though it might be said that a certain patient was ideal for thoracoplasty, he did not believe that the surgical interference was a matter of life and death. He had had such patients in hospital for many months and had waited for as long as two years until the patient, in his judgement, was well enough to undergo thoracoplasty. The decision to operate at any given time was fraught with grave responsibility and carried with it serious possibilities for the patient.

Dr. W. J. Newing, after congratulating those who had taken part in the discussion, said that he would confine himself to the rather weather-beaten controversy as to when and whether patients should be handed over to the surgeons. He felt that the physician should always be the arbiter as to when a proposed operation should be performed. Patients were curable nowadays even without operative interference. Surgeons did not all realize how many of the patients recovered under the influence of the routine measures adopted at sanatoria. Dr. Newing was glad to hear from Dr. Hutson that unilateral disease was a prime indication for operation, or rather that bilateral disease was a contraindication. At the private sanatorium in which he treated patients, some forty of them had had the operation of major thoracoplasty with the removal of seven to nine ribs each. The term "return to work" after those operations was a relative one; none of them was capable of sustained effort and the vital capacity was considerably reduced. Nevertheless they were alive and the results had been satisfactory. A long period of rest prior to operation was essential to good results; a rising immunity healed the surrounding lung tissue. The objective of thoracoplasty was solely and simply to close cavities rather than to immobilize the lung.

Dr. Colahan, in reply to Dr. Fitts, said that for ten years he had been a physician on the honorary medical staff of Saint Vincent's Hospital, and he was still a physician trying to practise surgery. He thought that he had been moderate in outlining the indications for operation. He reminded the radiologists that he had finished his opening statement by saying that the statistics would have to be revised in view of the revelations of tomography. In reply to Dr. Newing, Dr. Colahan said that he could produce several patients who had undergone thoracoplasty and could carry on hard manual occupation in full activity; they could not only work hard, but could swim and play such strenuous games as tennis. He had intended to stress the point that nobody held that surgery cured pulmonary tuberculosis; the patients had to cure

themselves, and the surgical procedures were only accessory to protracted treatment in and out of sanatoria.

Dr. Colahan said that Dr. Hutson had mentioned that in the series of cases he had analysed he had included many patients who should have been disqualified for operative treatment. Another surgeon had claimed an operative mortality rate of only 3% among those doomed by the physicians to die within five years. In conclusion, Dr. Colahan thanked the members present for the way in which they had received his remarks.

Dr. Hutson said that at the Austin Hospital they often observed the healing of small cavities and the test of healing involved in return to normal life. He referred to certain English figures, which indicated that of patients coming into sanatoria with cavities 80% were dead within three years and 95% within fifteen years. He added that after operations the patients had to spend many months or even a year in bed.

A MEETING of the New South Wales Branch of the British Medical Association was held on June 22, 1939, at the Royal North Shore Hospital of Sydney. The meeting took the form of a number of clinical demonstrations by members of the honorary staff of the hospital. Part of this report appeared in the issue of September 23, 1939.

Pulmonary Tuberculosis Treated by Bilateral Artificial Pneumothorax.

DR. BRUCE WHITE showed a young woman, aged twenty-three years, suffering from pulmonary tuberculosis, who was undergoing treatment by bilateral artificial pneumothorax. She had reported as a contact for examination for several years, as there had been a bad history of tuberculous infection in her family. Eighteen months previously she had developed a cough after an attack of influenza and had reported to the tuberculosis clinic at Albion Street. Radiological examination had revealed an exudative lesion with cavity formation in the upper zone of the right lung. A skiagram of her chest had been taken four months previously and had revealed no sign of disease. It was decided to institute collapse therapy on the right side; she was admitted to hospital, where artificial pneumothorax was induced, with good collapse of the right lung. The patient was sent to a sanatorium, and during nine months in residence there gained in weight and improved both clinically and radiologically. On her return to Sydney, however, her general condition deteriorated in a few weeks, when it was discovered that she was obtaining insufficient food. It was found that she was compelled to pay for her board and lodging and clothe herself on the invalid pension. Arrangements were made for extra nourishment and for her to live on the mountains. At the time of the meeting she had regained most of the weight she had lost, and fortunately the disease on the right side was well controlled, despite the development of three small adhesions which prevented complete collapse of the lung. The pneumothorax on the right side had been maintained by refills at intervals of three weeks.

Routine radiological examination, however, three months prior to the meeting had revealed a small fresh lesion on the left side. An area of exudation had developed in the upper zone of the left lung, with a cavity about three centimetres in diameter. It was decided to admit the patient to hospital for induction of pneumothorax on this side. This had been carried out recently, and in a skiagram taken on the day of the meeting there was no evidence of the cavity, and the disease process appeared to be well under control. Air refills were being given on the right side in conjunction with those on the left, and the patient was experiencing no discomfort or distress.

Dr. White pointed out that bilateral artificial pneumothorax treatment was well tolerated by most patients. He quoted Burrell's case, that of a woman who had diabetes (treated with insulin) associated with pulmonary tuberculosis. She used to travel fifty miles for her refills and then go to the theatre. Dr. White also drew attention to the fact that while so many patients made excellent progress in sanatoria, on their return to Sydney they did not maintain the improvement. In many cases this was due to the lack of sufficient food, and in some to want of cooperation, despite the lessons of sanatorium régime.

Pulmonary Tuberculosis Treated by Intrapulmonary Injection of Gelatin Acriflavine Calcium Chloride.

Dr. White also showed two patients suffering from chronic pulmonary tuberculosis who had been treated by intrapulmonary injection of gelatin acriflavine calcium chloride ("G.A.C.C."). The first patient, a male, aged twenty-eight years, had suffered from the disease for about five years. He had had sanatorium treatment for two years; but the disease had steadily progressed, and two years prior to the meeting collapse therapy by artificial pneumothorax had been undertaken to endeavour to control cavitation in the lung. This had not been successful, and phrenic paralysis by avulsion of the left phrenic nerve had been carried out nine months previously. The disease had steadily progressed, and early in 1939 radiological examination had revealed three large cavities in the left lung. The patient's general condition was becoming much worse. The patient had agreed to have treatment with "G.A.C.C." injections, which were commenced in February, 1939. Five were given at weekly intervals, with improvement, and a further series of five was given after an interval of six weeks. At the time of the meeting there had been very pronounced clinical and radiological improvement. Two of the cavities on the left side were no longer visible in a recent skiagram, and there was considerable diminution in the size of the third.

The second patient, a woman, aged forty years, had developed pulmonary tuberculosis three years previously. She had improved with sanatorium treatment and her general condition was very good; but she still had a cavity about six centimetres in diameter in the right upper lobe. There was very little evidence of disease elsewhere in her lung fields. She was admitted to hospital for "G.A.C.C." injections and three were given at weekly intervals. After the second injection the patient had been quite ill; she complained of severe pain in the right side of her chest, and her temperature was elevated for one week. There was a slight reaction after the third injection. The patient was not anxious to have further injections then, but wished to have more at a later date. So far the result could not be considered satisfactory, as there was no change in the radiological appearances.

Dr. White said that it was too early to state that "G.A.C.C." injections would be of permanent benefit. The result obtained so far in the first case was, however, extremely encouraging. He stated that Hunter and Peill, in *The British Journal of Tuberculosis* of July, 1938, had given a preliminary report on the intrapulmonary injections of "G.A.C.C." in humans suffering from chronic pulmonary tuberculosis following a rather large series, extending over a period of several years, of experimental injections into animals. The treatment was an attempt to simulate Nature's ultimate healing in tuberculosis, namely, calcification. Hitherto the administration of lime salts by the alimentary tract or by injection had not increased the rate of calcification; but there had been sufficient animal experimentation to indicate that parenteral injections of calcium hastened calcification. Therefore "G.A.C.C." had been introduced. The solution was used quite hot and given in a twenty cubic centimetre syringe. The two patients shown had large cavities, and an endeavour had been made to give the solution into the cavities after localization by means of antero-posterior and lateral X ray films. The skin and pleura were first anæsthetized and the large needle with syringe attached was inserted, suction being maintained on the piston. After a large bubble of air had been withdrawn the solution had been slowly injected. According to Hunter and Peill, there was very little danger in the procedure; a large number of injections had been given into the lungs of rabbits without any attempt to ascertain whether the solution was injected intravenously. Of 79 such animals, two had died as a result of cerebral embolism. After 172 injections, which were given after care had been taken to avoid intravenous injection, there were no serious results.

Multiple Hydatid Cysts of the Lung.

Dr. White's next patient was a girl, aged eight years, whose mother had died nine months previously from pulmonary tuberculosis. She lived in the country, and soon after her mother's death had been sent by her medical attendant for an X ray examination of her chest. Three large round shadows were observed in the skiagram. One, approximately twelve centimetres in diameter, occupied about one-third of the right lung field in the upper part, and there were two smaller shadows, approximately six to eight centimetres in diameter, in the left lung field. One of the latter was situated opposite the aortic arch and the other behind the heart shadow. Small areas of calcification in the hilar regions were also observed. The child had been admitted to hospital five months before the meeting. Clinical examination revealed bulging of the chest wall in the right infraclavicular region; the percussion note was dull and breath sounds were absent on auscultation. No other abnormal signs elsewhere were noted. There was no reaction to the Casoni test and the blood count was normal. There was no eosinophilia. Dr. Coppleson saw the child in consultation and agreed to operate. An incision was made over the fourth and fifth ribs in the posterior axillary line on the right side. One inch of each of these ribs was removed and a small piece of gauze was packed over the pleura. A week later the wound was reopened, the gauze was removed, and after aspiration of a large quantity of clear fluid a small incision was made through the pleura and a complete hydatid cyst was removed from the lung substance. A drainage tube was inserted. Nine weeks later similar operative procedures in two stages were undertaken on the left side; two incisions were made, one over the seventh and eighth ribs in line with the angle of the scapula, the other over the second and third ribs in the mid-clavicular line. After the second stage of the second operation the child was very ill for three days, but soon made an uneventful recovery. At the time of the meeting all wounds were completely healed and the patient was in excellent condition. Radiological examination then revealed practically normal lung fields. A little "scarring" could be discerned in the upper zone of the right lung. Dr. White said that he wished to congratulate Dr. Coppleson on an excellent surgical result. He drew attention to three facts: that multiple hydatid cysts of the lung were extremely rare; that in this case, as in the majority of uncomplicated cases of hydatid disease of the lung, there were no symptoms; and that such cases were usually discovered by accident.

Chronic Gastritis Treated by Gastric Lavage.

DR. DOUGLAS ANDERSON showed a young man who had suffered from chronic gastritis, whose dyspepsia of long standing had been relieved and whose stomach had regained the power of secreting free acid after a short course of gastric lavage with dilute hydrogen peroxide solution. The patient's resting gastric juice contained an excessive amount of mucus, and it was pointed out that, so long as the stomach was able to secrete mucus, treatment was likely to restore the power of secreting free acid. The principal treatment consisted in teaching the patient to pass Ryle's tube, and by this means to irrigate his stomach every morning, using a syringe and hydrogen peroxide solution, beginning with one fluid drachm to a pint of warm water and increasing gradually to four fluid drachms to the pint. The lavage was continued each morning till no more mucus was aspirated in the washings. It was stated that chronic gastritis was a very common disorder, seldom due to alcohol, and readily diagnosed by examination of the gastric secretion.

Blocked Aerocolon.

Dr. Anderson also showed a woman, aged fifty-eight years, who had long suffered from left hypochondriac pain, flatulence and severe constipation. An X ray examination revealed elevation of the left side of the diaphragm due to air in a redundant descending colon. Omission of purgatives, the administration of charcoal by the mouth and of a little liquid paraffin with agar, and an occasional enema had given much relief.

Pneumoliths.

Dr. Anderson also showed some small lung-stones coughed up by a girl suffering from pulmonary tuberculosis.

Arachnodactyly.

Dr. Anderson finally showed a girl, aged twenty-two years, who had spider fingers and rarefaction of the bones, and who had recently suffered much pain from deformity of the spine.

Perthes's Disease.

DR. H. H. JAMIESON showed a female, aged five and a half years, whom he had first seen in December, 1935, on account of a limp. On examination all movements of the left hip joint were seen to be only slightly limited. An X ray examination revealed Perthes's disease. The child had been treated by rest in bed and the application of a plaster hip spica and a walking caliper. Dr. Jamieson said that she had been walking without any symptoms for some months, and X ray examination showed that the condition was quite arrested.

Paralytic Ileus and Dilatation of the Stomach.

Dr. Jamieson also showed a female patient, aged seventeen years, who had been admitted to hospital on May 31, 1939. She had had pain in the stomach for two days. Nausea was present. The bowels were well open. There were no urinary symptoms, and menstruation was normal.

On examination her tongue was seen to be dry and coated. Extreme tenderness and some muscular guarding were present in the right iliac fossa. The area over McBurney's point was very tender.

On May 31, 1939, appendicectomy was performed and a small ovarian cyst was removed. For the next two weeks the patient's temperature rose to as much as 101° F. every day. She had gradually increasing pain in the abdomen. Extreme tenderness had been present for the last two days, particularly in the flank. Dysuria and frequency of micturition were present and the abdomen was distended.

On June 14, 1939, operation was undertaken. The abdomen was opened by a lower mid-line incision. A large quantity of thin watery pus poured out. A tube was inserted into the pouch of Douglas and the abdomen was closed. Glucose (10%) in saline solution was given by the continuous intravenous drip method at the rate of fifteen drops per minute; this was continued for five days, when about seven pints had been given. Saline solution was also given *per rectum*. Vomiting began one day after operation. Ryle's tube was inserted and the stomach was aspirated. The vomiting ceased.

On June 20, 1939, pus was still draining from the abdomen. The patient's colour was very blue; this was due to sulphanilamide. Examination of the blood revealed methæmoglobinæmia but no sulphæmoglobinæmia. Two grains of methylene blue were given for three doses every six hours and the patient's colour greatly improved. *Streptococcus viridans* was grown in pure culture from the pus. Dr. Jamieson said that the patient's condition appeared to be slowly improving.

Cholecyst-Gastrostomy for Carcinoma of the Pancreas.

DR. R. A. MONEY'S first patient was a female, aged seventy-three years, who had noticed jaundice, gradually increasing, for three weeks; it had been accompanied by vomiting. Epigastric pain and flatulence had been present for twelve months but had not bothered her much. Seven years ago she had had an attack of boils and glycosuria, from which she made a good recovery.

On examination the patient was deeply jaundiced. Tenderness was present in the hypochondrium and epigastrium on the right side, and a mass was palpable in the epigastrium. The urine was deeply bile stained and the fæces were putty coloured.

The Van den Bergh reaction elicited a direct positive result; the serum bilirubin level was 20 milligrammes *per centum* and the diastase index of the urine was less than six units. Examination after a fractional test meal

revealed complete achlorhydria, with absence of blood and bile. The erythrocytes numbered 4,400,000 and the leucocytes 17,000 per cubic millimetre; the hæmoglobin value was 80%. The result of the sugar tolerance test was normal and there was no reaction to the Casoni test. An X ray examination after an opaque meal and enema revealed no abnormality.

Laparotomy was performed on May 18, 1939; the gall-bladder and bile ducts were found to be enormously dilated and contained white bile. The ampulla of Vater was impassable even to a small probe. The head of the pancreas felt unduly hard and irregular, and was regarded as being carcinomatous. The liver was enlarged one and a half inches below the costal margin. The stomach and duodenum appeared normal. Cholecyst-gastrostomy was performed. Thereafter the jaundice gradually disappeared, and on May 24 the serum bilirubin level was only two milligrammes *per centum*. The patient's condition improved with the assistance of "Campolon", and "Desicol" (dried whole bile) by mouth, although a lævulose tolerance test revealed residual impaired liver function.

Tube Skin Grafting for Scarring of the Leg.

Dr. Money next showed a male patient, aged eleven years, who had been knocked down by a motor car two years and nine months earlier; he had had the skin torn from his right leg all the way round, so that it was "ring-barked". Healing had occurred by scar tissue, which was very tight and constantly breaking down, and the foot often swelled. Examination revealed a tight stricture of scarred skin around the right leg, covered with flakes of dried epithelium and two ulcers.

At the first stage operation on April 20, 1939, a strip of skin, about eight inches long by two inches wide, was raised from the posterior aspect of the right thigh and formed into a tube. At the second stage operation, on May 25, 1939, the distal attachment of tube and the associated square piece of skin were raised and replaced, as the colour did not appear satisfactory.

When the patient was shown the condition of the tube was good, and Dr. Money explained that the following additional stages were contemplated: (i) transplantation of the distal end of the tube to the distal edge of the area of scarring, the knee being fixed to a right angle and kept in that position by plaster of Paris until the grafted end had "taken"; (ii) transplantation of the proximal end of the tube to the proximal edge of the area of scarring, excision of a strip of scar tissue and opening out of the tube to take its place.

Empyema following Broncho-Pleural Fistula and Bronchiectasis.

Dr. Money's final patient was shown in conjunction with Dr. Bruce White. The patient was a female, aged eleven years, who for years had been attending the pulmonary clinic for bronchiectasis which had developed four years earlier after pneumonia. When she was admitted to hospital she complained of pain in the left side of the chest; she had had blood-stained sputum for two days, vomiting for one day, and attacks of fever.

Examination revealed a temperature of 102·6° F. The percussion note was dull in the left axilla and at the base of the left lung posteriorly. There were râles in both lungs. Amphoric breathing and pectoriloquy could be detected in the left axilla and posteriorly. The foul-smelling sputum contained no pneumococci or other pathogens; but it was copious, the amount being up to four ounces a day. The blood sedimentation rate was 22. A blood count gave the following information: the erythrocytes numbered 5,200,000 and the leucocytes 19,300 per cubic millimetre, and the hæmoglobin value was 75%. An X ray examination revealed bilateral bronchiectasis with recent left-sided consolidation. Treatment with "M & B 693" was commenced and the temperature fell from 101° to 99° F. in two days; but two weeks later signs of empyema appeared. *Paracentesis thoracis* was performed on two occasions, and green pus was withdrawn; it contained Type V pneumococci.

On February 16, 1939, thoracotomy was carried out under local infiltration anæsthesia and closed drainage of an empyema cavity was attempted. This was not very successful, owing to the presence of a broncho-pleural fistula. As the empyema cavity became smaller the thoracotomy opening became valvular, and a positive pressure pyopneumothorax frequently developed, with high pyrexia; relief was obtained when the drainage tube was reinserted. The fistula and cavity were then clearly outlined radiologically after lipiodol had been instilled, and on April 27, 1939, a modified extrapleural thoracoplasty was carried out. A regenerated piece of rib around the opening in the chest wall was resected and two bronchiectatic cavities and their associated bronchi were marsupialized to the exterior. The wound was packed wide open with gauze. This allowed free dependent and continuous drainage from the bronchiectatic cavities. The child's cough and sputum disappeared, and her general condition improved greatly. Dr. Money said that the cavities and bronchi had been painted regularly, first with a 4% solution of silver nitrate in *Spiritus Ætheris Nitrosi*, and more recently with Carney's solution. Contraction and cicatrization were occurring rapidly. When the child was shown, only one small fistulous opening could be seen, from which a clear mucoid discharge occurred when she coughed. Dr. Money said that if the patient's general condition improved further and the fistula did not close, lower lobectomy might be contemplated.

Carcinoma Ventriculi.

Dr. Money also showed a specimen of an extensive *carcinoma ventriculi*, removed from a young woman, aged thirty-two years, who had since died. Charts showing the fractional test meal curves of the patient and of her three brothers, aged thirty-one, forty-one and forty-three years, were shown; all charts revealed complete achlorhydria. As a result of these findings prophylactic doses of hydrochloric acid with meals had been ordered for the brothers for the rest of their lives.

Lichen Planus.

DR. F. C. FLORANCE showed a male patient suffering from *lichen planus*; he had a typical lesion, which had been present for about six months. He had been treated by rest and sedation; half a grain of phenobarbital was given twice a day. He had also been given half-ounce doses of *Mistura Hydrargyri Perchloridi Composita* three times a day. Lumbar puncture was performed and ten cubic centimetres of clear fluid were allowed to escape slowly. Calamine lotion was used to allay the itching.

Basal and Squamous Cell Carcinoma.

Dr. Florance then showed a number of patients suffering from basal and squamous cell carcinoma who had been treated by irradiation. He gave the area of the lesion in each instance and described the dosage given.

Epithelioma.

DR. H. J. HAM showed a man, aged fifty-nine years, who had been first referred to him early in October, 1938. In April, 1938, a small epithelioma of the right side of the lower lip had been treated with X ray therapy by Dr. F. C. Florance, and the lesion had completely disappeared and remained well locally. The patient, however, had not reported at frequent intervals for inspection of his glandular areas; and when seen in October, 1938, he had a hard submaxillary gland mass, two centimetres in diameter, fixed to the mandible on the right side, and also a hard malignant gland mass, four centimetres in diameter, in the right deep cervical group, deep to the sterno-mastoid muscle and not freely mobile. On October 21, under general anæsthesia, the submaxillary gland mass was implanted with radium needles and the lower larger mass with gold radon needles; in each case a volume of tissue well wide of and including the gland mass was implanted systematically so that homogeneous irradiation would be obtained. Two months after this treatment the secondary gland masses could no longer be palpated and the skin of the neck was soft without scarring. The

patient still appeared well at the time of the meeting. Dr. Ham considered that permanent disappearance of isolated malignant gland masses could be obtained by carefully planned radium or radon implantation; there was no danger associated with the insertion of long radon needles in the case of deep cervical glands, as these needles had blunt ends and would not penetrate the great vessels.

Dr. Ham's second patient was a man, aged seventy years, who had consulted him early in February, 1939; at that time he had a large hard mass attached to the mandible and projecting about two inches in the submental and right submaxillary regions. On examination a small epitheliomatous growth was found in the mid-line of the floor of the mouth, 1·5 centimetres in diameter. A biopsy of this lesion was made and the pathologist reported that it was an epithelioma. The external mass was considered to be secondary to the mouth lesion. X ray examination of the mandible revealed no osseous lesion. On March 10, 1939, radium needles were implanted in the floor of the mouth; they were left in position for six and a half days so as to give a dose of 6,000 *r* over seven days.

At the time of the meeting the floor of the mouth appeared to be free from neoplasm, and in the right submaxillary region there was a flat scar with some induration, which was gradually decreasing. Dr. Ham said that the patient was shown to demonstrate the immediate results of interstitial implantation in a large malignant mass adjacent to bone. There was no danger to the bone if the implantation was carefully planned.

Conservative Radical Mastoid Operation (Bondy).

Dr. E. P. Blashki showed a male patient who prior to examination had had an aural discharge on and off for years. Perforation with cholesteatoma was present in the attic region. A mass of this was removed during conservative treatment, but the ear continued to discharge slightly; material could always be blown out of the perforation by means of a cannula. At operation a large cavity was found in the mastoid process, with a mass of cholesteatoma. A typical conservative radical operation (attico-tympanotomy) was performed; only a simple slit in the posterior wall was required for plastic purposes.

Nasal Fibroma.

Dr. Blashki then showed a boy who had been brought to the hospital on August 1, 1938, suffering from epistaxis. A mass of growth was seen in the post-nasal space; this was the source of the bleeding. It was treated with a radium pack in the post-nasal space. This led to cessation of bleeding and to some shrinkage of the tumour. Several months later the boy was admitted to hospital and as much as possible of the tumour was snared off with the diathermy snare. It was reported to be a fibroma. Dr. Blashki said that there was a residue which had enlarged somewhat. It was not causing much obstruction. When symptoms recurred it was proposed to attack and remove the growth by a lateral rhinotomy.

Simple Mastoid Operation.

Dr. Blashki then showed two patients who had been subjected to the simple mastoid operation; the wounds were closed by suture and glass tube drainage, as recommended by Bondy, was used. The first patient was a female, aged thirty years, who had been admitted to hospital on May 17, 1939, after having suffered from otitis for four days. Paracentesis was performed. The otitis was severe and was accompanied by fever and continuing pain, which subsided after about one week. In the second week the pain returned and the discharge was profuse. The mastoid process was tender and the patient's temperature was still elevated. Operation was performed at the end of the second week. The wound was closed and a drainage tube was put in. This was retained for two weeks. The discharge had continued for this period, but the general improvement in the patient was notable.

The second of the two patients was a female, aged thirty-two years, who had been admitted to hospital on June 6, 1939. The patient had had pain in her ear after bathing and had been first seen three weeks later. The appearance of the ear drum was typical of acute otitis; land-marks were lost and a sausage-shaped swelling was present. There were no perforation and no discharge. The mastoid process was tender and a diagnosis of acute mastoiditis was made. An X ray examination showed that the whole mastoid process was cloudy; there was some loss of definition of cells, especially around the mastoid antrum. A simple mastoid operation was performed and some pus was found scattered throughout the cells. The wound was closed and a drainage tube was put in the lower corner. Dr. Blashki pointed out that this patient was a diabetic; her blood sugar level was 0·995 milligrammes *per centum*.

(*To be continued.*)

Special Correspondence.

LONDON LETTER.

By Our Special Correspondent.

It has long been evident to Australians and Anglo-Australians resident in England that war between the British Empire and Hitler was inevitable, and the feeling has been steadily growing at a rapidly increasing tempo that the sooner it came, the better. That war was inevitable has been foreshadowed in no unmistakable terms in your special correspondent's London letters in The Medical Journal of Australia of January 21 and May 20, 1939.

Since the latter date the British Medical Association has held its annual meeting in Aberdeen. Its representative meeting was the most largely attended in the history of the Association. Australian representatives included General R. M. Downes, Dr. A. A. Palmer, Dr. W. W. Seed and Dr. L. E. Le Souef. The meeting was also noteworthy for the further fact that those Australian Branches who had no members of their own actually attending the representative meeting arranged, for the first time in the Association's history, to be represented by delegates of their own nomination now resident in England. Queensland thus nominated Dr. Henry Robinson, a member of the Central Finance Committee, and Tasmania, Professor R. J. A. Berry, a member of the Board of Directors of *The British Medical Journal*. Every Australian Branch was thus represented either directly or indirectly by accredited nominees qualified to vote on all matters presented to the "A.R.M." As it is the annual representative meeting that decides the policy of the Association, leaving the Central Council to carry it out, the significance of a full and complete voting power by the Australian Branches is obvious.

Opportunity was taken of this complete Australian representation to inform them privately but accurately of the proposals recently discussed by a special committee of the Central Council for meeting some of the difficulties encountered recently in South Africa and more remotely in Australia by the publication and circulation of two medical journals, *The British Medical Journal* and the local one, especially with a view to lightening the financial burden of members of the British Medical Association resident in these two overseas dominions. It is understood that the Australian representatives were favourably impressed by the proposals which the Central Council proposed to submit to the Australian Federal Council for their acceptance, modification or rejection.

Problems of human heredity in their relation to disease and the profession of medicine have within recent years assumed an importance and a degree of scientific precision surprising to those medical men previously familiar only with the elementary principles of a century-old Mendelism. The Seventh International Genetical Congress, held in Edinburgh from August 23 to 30, 1939, was at once a great

scientific success and an international debacle. For some curious reason—possibly an intelligent forecast of the unexpected German-Russian pact, a case surely of the lion lying down with the lamb, or at least of the leopard trying to hide his spots—the Russian delegates did not materialize, nor did the appointed Russian President think it necessary to journey to Edinburgh to assume the presidential mantle. In his political absence the Congress elected as its President Dr. F. A. E. Crew, Professor of Animal Genetics in the University of Edinburgh, and never was a worthier or more deserving understudy promoted to a position which was his by reason of scientific attainment—recently elected a Fellow of the Royal Society—and services rendered.

The Congress was attended by about 560 delegates from 33 countries. But Hitler's shadow developed into total eclipse. Two days after its official opening all the German delegates returned to the adopted Fatherland of their *Führer*. Next day most of the Scandinavian representatives decided to cross the North Sea while the going was comparatively torpedo-proof from the Hitlerian submarines which had been on their war stations at least a fortnight before the official declaration of war.

The British Association for the Advancement of Science was not so fortunate as the Genetical Congress. In a mildly optimistic mood it proceeded with some of its opening addresses at Dundee, including that of the President, and thus did Dundee of 1939 recall the Melbourne of August, 1914. With the outbreak of war the proceedings were brought to a summary conclusion, but what and when the final end will be no man yet alive can tell.

Correspondence.

ELECTRO-MEDICAL APPARATUS AND RADIO INTERFERENCE.

Sir: I wish to draw attention to the fact that Australian legislation in connexion with this matter will almost certainly be enacted in the near future.

In several other countries statutes relating to this aspect of broadcasting have already been passed. These regulations are usually brought forward by departmental and commercial interests, with the result that restrictions concerning some of the more important of the electro-therapeutic methods may be introduced. This legalized form of injustice is particularly likely to occur if the medical profession is not fully prepared to make a firm and united protest against any proposed infringement of its right to treat each and every patient by the most appropriate means at its disposal, a right which definitely should not be interfered with by political considerations or by arrangements for the amusement of the public.

Instances of the extent to which the progress of medicine may be adversely affected by hasty and ill-considered legislative proposals are available to all those practitioners who care to make a study of the legal proceedings and broadcasting regulations of other parts of the world. An outstanding example has recently been reported from America (*Archives of Physical Therapy*, May, 1939). There the Federal Communications Commission has assigned two very broad bands of the electro-magnetic spectrum to the requirements of television and has shown every indication of its desire to prevent even the faintest interruption of programmes on these bands. The policy would appear to be rather impracticable, since radio-interference is sometimes caused by public utilities, such as lifts, street lights, electric motors *et cetera*. The use of these cannot, of course, be prohibited, and it follows that any attempt to legally restrict medical activities will only be dealing with a portion of the problem.

As most of your readers are probably aware, very little interference is caused by any of the apparatus now used in medical or surgical practice. The chief offenders are the spark gap diathermy unit and certain types of mechanical rectifier used for X ray purposes. The former is being gradually replaced by the valve-operated short-wave generator, which is comparatively localized in its emission; and the latter is, of course, obsolescent, so it is quite apparent that wireless messages, programmes *et cetera* are not greatly interrupted by the various methods employed in the application of electricity to the body.

While not suggesting any reduction in the cooperation which has always existed between the medical profession and non-medical organizations in matters affecting the welfare of the people, one feels constrained to recommend that, in the consideration of this problem, a small sacrifice should be made by the members of the interested firms. The trifling disability will, perhaps, be more cheerfully endured by them when they realize that every stray interruption of television or auditory programme may represent an effort to overcome disease or even to avoid death.

Briefly stated, the essential features of the situation are as follows: firstly, restrictive regulations regarding radio-interference by electro-medical apparatus are unnecessary; and secondly, their introduction may best be avoided by unanimous opposition on the part of the medical profession when the proposals are first put forward.

Yours, etc.,

K. R. Speeding, M.B., B.S., (Melb.), D.R. (Edin.).

61, Collins Street,
Melbourne.
Undated.

TUBERCULOSIS ENDOTOXOID.

Sir: The issue of your journal dated September 23, 1939, contains a very valuable comment on the production and clinical use of tuberculosis endotoxoid. The reference is particularly to the work of E. Grasset, of the Serum Department of the South African Institute for Medical Research.

The process of extraction of the antigenic principles from tubercle bacilli, as outlined, is a tedious and very involved one, and does, undoubtedly, result in the serious impairment of antigenic properties. For the past four years I have been making and using with conspicuous clinical success dissolved vaccines, the final product being an endotoxoid (isotonic, pH 7·4, non-irritant, non-toxic and highly antigenic). Purely experimentally the solution *in vitro* of tubercle bacilli was accomplished and a water-clear colloid standardized in carbol saline was obtained.

I am willing to make this tuberculosis endotoxoid, free of cost, for any individual or institute who would be sufficiently interested to communicate with me and requisition supplies for experimental clinical use. Naturally the State institutions for tuberculosis and the institutional medical officers would be most suitable.

As the time at my disposal for any new work is limited, it would be necessary to send me well-grown cultures of tubercle bacilli, on solid media, perhaps even going to the length of obtaining autogenous cultures from patients willing to undergo treatment with the endotoxoid.

Yours, etc.,

A. J. Fitzgerald.

Craignish,
185, Macquarie Street,
Sydney,
September 26, 1939.

Obituary.

EDWARD RYAN.

Dr. Edward Ryan, whose death was recorded recently in these pages, died at his home, "Lowan", Studley Park Road, Kew, Victoria, after a short illness. He was seventy-six years of age and had practised as an ophthalmic surgeon in Collins Street, Melbourne, for about thirty-two years.

Edward Ryan was born at Ararat, Victoria, and was the second son of the late Michael and Margaret Ryan, of "Lalla-Rookh", Ararat. His early education was undertaken at Xavier College, and he was the first student from that college to matriculate. He was the first *dux* and captain of the school and later was president of the Old Xaverians' Association. He studied medicine at the University of Melbourne and graduated Bachelor of Medicine in 1884. He practised first at Nhill, Victoria, as a general practitioner for about eight years. He then went to London where he spent two years in the study of ophthalmology and after his return started practice at 33, Collins Street, Melbourne.

Ryan was recognized as a sound and reliable ophthalmologist and as a diligent worker. He held many positions and was for some years senior ophthalmic surgeon at Saint Vincent's Hospital. He was President of the Ophthalmological Society of Victoria. Always interested in any movement relating to medical practice, he was a Foundation Fellow of the Royal Australasian College of Surgeons. He attributed whatever success he had in his specialty to the fact that he had spent some years in the country as a general practitioner. He was held in high esteem not only by his fellow practitioners, but by large numbers of patients who came to his surgery from Melbourne and from distant parts of the Commonwealth.

Ryan was known in the business world and was interested in sport and in art. He was one of the oldest members of the Victorian Racing Club, the Victorian Amateur Turf Club, and the Royal Melbourne Golf Club. In his younger days he was a good cricketer, and in conjunction with J. W. Trumble, the Australian test cricketer, was one of the pioneers of golf in the Wimmera district. He was a good field shot and had a fine collection of English field guns and a string of good pointers and setters. In the business world he was a director of the National Trustees, Executors and Agency Company Limited. He was an enthusiastic art collector and connoisseur, and had a very fine collection at his private home. He derived the greatest pleasure in showing his treasures to his friends.

Ryan's wife, who was a descendant of early Victorian pioneers, died about a year ago. He has left seven children, five of whom are at the University of Melbourne. Two sons are studying medicine and two are studying law; a daughter is studying arts. His brothers are Dr. T. F. Ryan, of Collins Street, and Mr. Gerald Ryan, architect, Temple Court. Two sisters live at "Lalla-Rookh", Ararat.

Dr. F. L. Davies writes:

It was my privilege to be associated with Dr. Edward Ryan for practically the whole of my medical career.

I first met him when attending the Eye and Ear Hospital as a medical student, but it was during my term as resident medical officer at Saint Vincent's Hospital that I commenced an association with him that continued up to the time of his death.

From our earliest association I can remember nothing about him that was not typical of the fine gentleman he was. His work was of the highest standard and the amount of work he did was very great.

The experience he gained when carrying on a large country practice stood him in good stead in all his special work, and he brought a full knowledge into any problem that might arise in the cases presented to him.

Great as his work was, and lasting as the tributes to his memory as the result of such work may be, it is by his character and personal charm that he will be remembered most.

He was a man of strong convictions, but despite this fact he was always courteous and gentlemanly in his actions and conversations. I have never known him belittle a man or his work, however much he may have differed from him; on the other hand, he was always ready to advise, help and praise.

For the foregoing reasons as well as others which I have failed to mention, he was a man held in universal esteem by the medical profession, by a very large clientele of patients and by the community at large.

Dr. J. A. O'Brien writes:

I have had the privilege of Dr. Edward Ryan's friendship for the past thirty odd years and feel that his death has left a gap in his branch of the profession which cannot be easily filled. He had the rare gift of combining great surgical skill and intuition with human sympathy and understanding of a very high order. His many years of general practice with a great deal of surgery in a large country district gave him a wide practical knowledge of medicine and surgery, and above all a practical psychology which is becoming all too rare in modern specialization. He never, even in his late years, lost his gift of initiative, which he always displayed to the full. A good knowledge of French and German enabled him to keep in touch at first hand with contemporary literature. As an instance of his awareness of current thought I think I am correct in saying that he was the first Australian, certainly the first Victorian, ophthalmic surgeon to perform the modern operation for detached retina following Gomin's method; this was in 1928, two years at least prior to its performance even in London. He was a man of many and varied attainments, combining a good knowledge and appreciation of music with a sound artistic sense, and there were few in the profession who did more to encourage Australian art in a practical manner, as witness the walls of his consulting rooms and home. I feel that I have lost a good friend, and that the profession in general will be the poorer for his passing.

IDA GERTRUDE MARGARET HALLEY.

We regret to announce the death of Dr. Ida Gertrude Margaret Halley, which occurred on October 1, 1939, at Maylands, South Australia.

JAMES JOSEPH PATRICK DELANEY.

WE regret to announce the death of Dr. James Joseph Patrick Delaney, which occurred on October 1, 1939, at Brisbane, Queensland.

Naval, Military and Air Force.

MEDICAL OFFICERS FOR AUSTRALIAN SPECIAL FORCE.

THE Acting Director-General of Medical Services announces that 104 medical officers will be required for the special force of 20,000 for service in Australia and abroad. The men to be appointed include 19 regimental medical officers, officers of three field ambulances and the staff of two hospitals and a casualty clearing station.

Medical men desiring appointment to the force abroad should make application to the D.D.M.S. in each military district, giving particulars of age, qualifications, whether married or single, and previous military experience. Some medical officers will be required to take up duties on November 1, 1939. Terms of appointment have still to be approved by Cabinet, but the pay and allowances will be those of the rank to which a man is appointed.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 94, of October 5, 1939.

AUSTRALIAN MILITARY FORCES.

First Military District.

Australian Army Medical Corps.

Honorary Captains A. D. A. Mayes and R. R. Winton are appointed from the Reserve of Officers (A.A.M.C.) and to be Captains (provisionally), supernumerary to establishment pending absorption, 13th September, 1939; the resignation of Captain (provisionally) S. G. Preston of his commission is accepted, 18th September, 1939.

Australian Army Medical Corps Reserve.

Major A. J. Kelsey is placed upon the Retired List with permission to retain his rank and wear the prescribed uniform.

To be Honorary Captains—Rudolph Sergius Lahr, Geoffrey Charles Huxtable Hogg, George Wilfred Pottinger, Kenneth Charles Moloney Madden, Arthur James Kennedy, Eric Lorimer Walker and Henry Arthur Sundstrup, 7th September, 1939; Harold Horne Power, Clive Rodney Boyce and James Joseph McIntosh, 8th September, 1939; Mortimer Maxwell Ramsden, Henry Winston Noble, Robert Evans, John Aloysius Lynch, Arthur Charles Ward, Roy Samuel Cohen, Robert Martin Smith and Harold Ainsworth Retallick, 11th September, 1939; Ewing George Thomson, 12th September, 1939; and Garth Mervyn Sydney May, 15th September, 1939.

Second Military District.

Australian Army Medical Corps.

Honorary Captains K. T. Hughes and B. Moore are appointed from the Reserve of Officers (A.A.M.C.), and to be Captains (provisionally), 18th August, 1939, and 1st September, 1939, respectively; Captain (provisionally) E. W. Ferguson is transferred to the Reserve of Officers (A.A.M.C.), and to be Honorary Captain, 11th September, 1939; the provisional appointment of Captain R. Huntley is terminated, 18th September, 1939. *To be Captain (provisionally)*—Ralph Huntley, 19th September, 1939.

To be Captains (provisionally)—John Rothwell Radcliff and John Purves Lyttle, 6th September, 1939, and 7th September, 1939, respectively. Captain (provisionally) W. M. Roberts is brought on the authorized establishment, 1st September, 1939. The provisional appointment of Captain W. H. Kellett is confirmed. Captain L. J. Woodland is transferred to the Reserve of Officers (A.A.M.C.), 1st September, 1939.

Australian Army Medical Corps Reserve.

To be Honorary Captain—Hartwell Bert Woolford, 4th September, 1939.

Third Military District.

Australian Army Medical Corps.

Captain (provisionally) R. S. Smibert is brought on the authorized establishment, 1st May, 1939. (In lieu of notice regarding this officer which appeared in Executive Minute No. 175/1939, promulgated in *Commonwealth Gazette*, No. 37, of 15th June, 1939.)

To be Captain (provisionally) supernumerary to establishment pending absorption—George Corss Love, 14th September, 1939. Honorary Captain R. W. S. Fox is appointed from the Reserve of Officers (A.A.M.C.) and to be Captain (provisionally) supernumerary to establishment pending absorption, 5th September, 1939. Captains (provisionally) V. G. Bristow and I. H. Cowling are brought on the authorized establishment, 1st July, 1939, and 1st September, 1939, respectively.

Australian Army Medical Corps Reserve.

To be Honorary Captain—Francis Esmond Browne, 15th May, 1939. (In lieu of notice regarding this officer which appeared in Executive Minute No. 175/1939, promulgated in *Commonwealth Gazette*, No. 37, of 15th June, 1939.)

Fourth Military District.

Australian Army Medical Corps.

To be Major—Captain H. M. Fisher, 4th September, 1939. *To be Captains (provisionally) supernumerary to establishment pending absorption*—Richard Alfred Amyas Pellew and John Lionel Hayward, 4th September, 1939. Captain B. H. Diamond is transferred from the Australian Army Medical Corps, 2nd Military District, and is supernumerary to establishment pending absorption, 15th September, 1939.

Fifth Military District.

Australian Army Medical Corps.

To be Captain (provisionally) supernumerary to establishment pending absorption—Claude Leonard Anderson, 5th September, 1939.

Australian Army Medical Corps Reserve.

To be Honorary Major—William Robert George Frayne, 5th September, 1939. *To be Honorary Captain*—John Francis Ebsworth, 5th September, 1939.

Sixth Military District.

Australian Army Medical Corps.

Honorary Captain P. Braithwaite is appointed from the Reserve of Officers (A.A.M.C.) and to be Captain (provisionally), 6th September, 1939.

Seventh Military District.

Australian Army Medical Corps.

To be Captain (provisionally)—Rupert Catalano, 14th September, 1939; the provisional appointment of Captain W. L. Fothergill is confirmed.

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force.

Medical Branch: Active Force.

Flight Lieutenant R. J. Aitchison, M.B., B.S., is promoted to the rank of Squadron Leader, 18th September, 1939. The following are granted commissions as Flight Lieutenants with effect from 18th September, 1939: Sidney Gordon Preston, M.B., B.S., David Scott Thomson, M.B., B.S., and Arthur George Rongo Uglow, M.B., B.S. The following are transferred to the Reserve with effect from date shown: Squadron Leader R. J. Aitchison, M.B., B.S.,

18th September, 1939; Flight Lieutenants G. E. Phillips, M.B., M.S., M.Sc., 13th September, 1939, and Flight Lieutenant C. H. Hembrow, M.B., B.S., F.R.C.S., F.R.A.C.S., 18th September, 1939.—(Ex Min. No. 309.—Approved 4th October, 1939.)

Nominations and Elections.

THE undermentioned has applied for election as a member of the Western Australian Branch of the British Medical Association:

Einichovici, Airum, M.D., 1924 (Pavia), Corrigin. (Registered by the General Medical Council.)

The undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Humphery, Ronald James, M.B., B.S., 1938 (Univ. Sydney), Hamilton Road, Fairfield.

The undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Adrian, Joseph, M.D., 1929 (Bologna), Murrayville.
Margulius, Martin, M.D., 1936 (Turin), 2, Fitzroy Street, St. Kilda, S.2.
Kenny, John Joseph Martin, M.D., B.S., 1937 (Univ. Melbourne), D.T.M., 1938 (Univ. Sydney), Commonwealth Serum Laboratories, Parkville, N.2.
Snow, Moses, M.D., 1935 (Rome), Natimuk.
Woodruff, Michael Francis Addison, M.B., B.S., 1937 (Univ. Melbourne), Royal Melbourne Hospital, Melbourne, C.1.

Diary for the Month.

OCT. 17.—New South Wales Branch, B.M.A.: Ethics Committee.
OCT. 18.—Western Australian Branch, B.M.A.: Branch.
OCT. 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
OCT. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
OCT. 25.—Victorian Branch, B.M.A.: Council.
OCT. 26.—New South Wales Branch, B.M.A.: Branch.
OCT. 26.—South Australian Branch, B.M.A.: Branch.
NOV. 1.—Western Australian Branch, B.M.A.: Council.
NOV. 1.—Victorian Branch, B.M.A.: Branch.
NOV. 2.—South Australian Branch, B.M.A.: Council.
NOV. 3.—Queensland Branch, B.M.A.: Branch.
NOV. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
NOV. 10.—Queensland Branch, B.M.A.: Council.
NOV. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments.

Dr. B. C. Smeaton has been appointed an Honorary Anæsthetist at the Adelaide Hospital, Adelaide.

* * *

Dr. C. H. Mollison has been appointed, pursuant to the provisions of Section 3 of the *Medical Act*, 1928, of Victoria, President of the Medical Board of Victoria.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xvi-xix.

COMMONWEALTH DEPARTMENT OF HEALTH: Medical Officer.
DEPARTMENT OF PUBLIC HEALTH, PERTH, WESTERN AUSTRALIA: Medical Officer.
ROYAL MELBOURNE HOSPITAL, VICTORIA: Medical Officers.
SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Surgeon.
THE QUEEN VICTORIA MATERNITY HOSPITAL (INC.), ROSE PARK, SOUTH AUSTRALIA: Resident House Surgeon.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	Wiluna Hospital. All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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